STATE OF HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
Honolulu, Hawai'i
January 13, 2011

Acceptance Date: August 10, 2010
180-Day Expiration Date: February 6, 2011

Board of Land and
Natural Resources
State of Hawai'i
Honolulu, Hawai'i

REGARDING: Conservation District Use Application (CDUA) KA-3562 for the 'Aliomanu Road Repair Project

APPLICANT: County of Kaua'i, Department of Public Works

LANDOWNER: County of Kaua'i, State of Hawai'i

LOCATION: Anahola, Kaua'i

TMK: (4) 4-8-018:028 and 029

AREA/USE: 10,155 square feet

SUBZONE: Resource Subzone

DESCRIPTION OF PROJECT AREA:

The proposed 'Aliomanu Road repair project is located on the eastern coastline at Anahola, Kaua'i, TMKs: (4) 4-8-018:028 and 029 (**Exhibits 1 & 2**). The project site lies within the Resource subzone of the Conservation District.

The project area of 'Aliomanu Road is being undermined by shoreline erosion, causing part of the road to collapse into the ocean (**Exhibit 3**). This area has experienced significant long-term erosion, with an average annual erosion rate of just under 0.5 feet per year (**Exhibit 4**). This area was originally a sandy coastline, but has now eroded to the road side, exposing its fill material and the clay substrate along the project area. Homes on the north side of Kuaehu Point were threatened, and seawalls and sandbag revetments were built to protect these homes.

The project area is in the natural transition from sandy beach to rocky and clay headland. The beach fronting the project area has already been consumed by erosion. Though the beach to the south, fronting the Anahola Stream mouth is accreting, it appears that the littoral cell (sediment system) for the project area does not have sufficient sediment to maintain any beach fronting the area. The natural progression for this area is continued erosion of the clay and rock substrate, exposing a low-sloped, shallow marine platform.

At the eroded embankment, barriers have been erected and one-lane traffic only is possible. 'Aliomanu Road beyond Anahola terminates north of the eroded area, and is the only road access for properties located north of the eroded area.

The beach along 'Aliomanu Road becomes thin and variable at the project site. The northern section contains boulders and smaller rock with very little sand. The beach grows wider as it leaves the project area south toward Anahola Stream. The nearshore reef area is flat, consists of rock and hardened sediment, and is partially dry at very low tides. The reef flat gradually becomes deeper as it extends about 600 feet out from the shoreline. Deep water waves break at the outer reef edge, and only small waves propagate over the reef flat (**Exhibit 5**).

Geotechnical borings were made at both the north and south ends of the project site. At the north end, the soils include silty clay fill to a depth of about 3 feet below ground surface with residual stiff clays and silts below the fill to a depth of 16 feet. The boring at the south end showed clayey silt fill to a depth of 2.5 feet and medium dense beach sand to a depth of 8 feet below the ground surface. Soft basalt was found below the sand. The clay and silt material are not considered a valuable natural resource. The layer of sand at the south end of the project has some value as a beach resource.

The layer of sand on the beach at the project site is not usually very thick and is mixed with boulders, cobbles, and gravel. Sand is typically transported to the south toward the apex of Anahola Bay where it collects on the beach near the Anahola Stream mouth or is moved offshore by the stream flow. Both trade winds and wave-driven currents push water over the reef flat causing strong currents to flow south along the shoreline.

BACKGROUND:

In December 2002, the DLNR opened a violation case alleging that the County of Kaua'i was creating a retaining wall alongside 'Aliomanu Road. The work consisted of embanking and repositioning one to three ton boulders along the edge of the road using an excavator.

The DLNR had sufficient cause to enforce this matter because it was evident that a portion of the structure was constructed within submerged lands considered to be Conservation District under the jurisdiction of the Board of Land and Natural Resources.

On March 25, 2004, the Board found the County in violation of Chapter 183C, Hawai'i Revised Statutes (HRS) for an unauthorized boulder structure, and ordered a fine of $2,000 and a condition that the County either remove the structure or submit a CDUA for an after-the-fact shoreline structure that includes a long-term beach nourishment plan for the area affected by the structure (**Exhibit 6**).

The County responded to the violation by paying the fine. In addition, on July 29, 2008, the County requested emergency authorization to repair wave erosion damage to 'Aliomanu Road and the embankment with a temporary emergency bank stabilization using coir sandbags along 200 feet of the shoreline at the damaged section of the roadway. The emergency measure would be maintained until they designed a permanent solution (**Exhibit 7**). The DLNR issued emergency authorization for their request on August 12, 2008 (**Exhibit 8**).

This subject CDUA is in response to Condition C of the violation order (**Exhibit 6**): "That the County of Kauai shall either remove the structure or submit a completed Conservation District Use Application for the unpermitted boulder structure within sixty (60) days of the Board's action and shall diligently pursue the CDUA permit within the time frames stipulated in Chapter 183C, Hawaii Revised Statutes. The application for an after-the-fact shoreline structure shall include a long-term beach nourishment plan for the area impacted by the structure." Staff notes, however, that this CDUA did not include a long-term beach nourishment plan.

PROPOSED USE:

The proposed 'Aliomanu Road repair project involves repair work to a damaged portion of the road and construction of a rock revetment shaped to the design slope, on the seaward side of the roadway. The rebuilt roadway will include a 2-foot wide paved shoulder to pre-erosion conditions. The rebuilt road will be stabilized with a new rock revetment to prevent future erosion of the road (**Exhibit 9**).

The rock revetment was designed using the Army Corps of Engineers' methods given in the *Shore Protection Manual* (U.S. Army Corps of Engineers, 1984). The revetment will consist of a double layer of armor stones and a double layer of bedding stones on a geotextile fabric filter. The revetment toe will be at a depth of -4 feet below mean sea level (MSL) to prevent future undermining of the roadway.

Excavated material from the trenching activities will be stockpiled south of the project site and be used as backfill material for the construction of the road and revetment. Total volume of rock fill is 2,391 cubic yards (CY). Approximately 220 CY of sand will be excavated at the south end of the revetment to bury toe stones. The sand will be placed over the toe stones and on the beach if it is clean (no silt/clay or vegetation).

The estimated design life of the rock revetment is 50 years with maintenance. Maintenance of the revetment will be needed the first five years because settling could dislodge a few armor stones that would have to be placed back onto the revetment. Once the settling has occurred, periodic inspection is recommended, especially after high wave events.

SUMMARY OF COMMENTS:

CDUA KA-3562 was referred to the following agencies for review and comment: DLNR – Kaua'i District Land Office, Division of Aquatic Resources, Historic Preservation Division, Engineering Division, and Division of Conservation and Resource Enforcement; Office of Hawaiian Affairs; Office of Environmental Quality Control; Department of Health; Department of Hawaiian Homelands; State Civil Defense; County of Kaua'i – Planning, Public Works, Police Department, Fire Department, Civil Defense; Army Corps of Engineers; National Oceanic and Atmospheric Administration; and the Kapa'a Public Library. The following comments were received:

<u>DLNR-Kaua'i District Land Office</u>
No comments.

DLNR-Historic Preservation Division (SHPD)
Numerous historic sites are known in this area including pre-Contact agricultural terraces, and the reef off this location is well known as a resource for limu kohu. Because of the planned use of sand from this area as project fill, SHPD believe that historic properties will be affected by this project. As a mitigation measure, SHPD recommends archaeological monitoring be conducted for all ground-altering activities, including removal of sand or fill. SHPD requests that an archaeological monitoring plan be submitted to SHPD for review and approval prior to the start of any ground-altering activities; and an archaeological monitoring report be submitted for review and approval within 180 days of the completion of monitoring.

DLNR-Engineering
Engineering confirmed that the project site, according to the Flood Insurance Rate Map (FIRM) is located in Zone VE. The Flood Insurance Program regulates developments within Zone VE. Project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations, whenever development within a Special Flood Hazard Area is undertaken.

State Civil Defense
State Civil Defense agrees with the inclusion of an archaeological monitor during excavation activities as well as the use of best management practices. They also agree that mitigating the negative effects of coastal erosion is important and that the revetment will be beneficial to this particular shoreline.

Army Corps of Engineers
Section 10 of the Rivers and Harbors Act of 1899 requires that Department of Army (DA) permit be obtained from the U.S. Army Corps of Engineers prior to undertaking any construction, dredging, and other activities occurring in, over, or under navigable waters of the U.S., including the upper limit of adjacent wetlands. Section 404 of the Clean Water Act requires that a DA permit be obtained for the discharge of dredge, and/or fill material into waters of the U.S. The line of jurisdiction extends to the Mean High Water Mark for tidal waters.

On July 12, 2010, the Corps issued a Notice of Provisional Nationwide Permit No. 3 to the applicant indicating that they could not issue a final verification for NWP#3 until the Clean Water Branch, State Department of Health issues a Section 401 Water Quality Certification (WQC) or waiver for the proposed action. The Corps currently has not received the WQC letter and as such, cannot proceed with the issuance of the DA permit.

> **Applicant's Response:** To date, the applicant still has not received any correspondence from DOH on the 401 WQC. Work will not start until the applicant has received DOH clearance.

NOAA
NOAA provided example Best Management Practices (BMPs) for consideration.

Kaua'i County Public Works Department
Supports project.

Kaua'i County Civil Defense
No comments.

Kaua'i County Fire Department
The Fire Department asked whether there are provisions if access is cut off for emergency vehicles. If access is compromised, notification to Police Dispatch and local Fire Station should be made.

ANALYSIS:

Following review and acceptance for processing, the applicant was notified, by letter dated August 10, 2010 that:

1. The proposed use is identified within the Resource subzone of the Conservation District, pursuant to Chapter 13-5, Hawai'i Administrative Rules (HAR) §13-5-24, R-6, MARINE CONSTRUCTION (D-1) *Marine construction, dredging, filling, or any combination thereof of submerged lands*;

2. Pursuant to §13-5-40(4), HAR, HEARINGS, a public hearing will not be required; and

3. In conformance with Chapter 343, Hawai'i Revised Statutes (HRS), as amended, and Chapter 11-200, HAR, a finding of no significant impact (FONSI) to the environment was issued on September 22, 2009. The final environmental assessment (FEA) for the project was published in the October 8, 2009 issue of the *Environmental Notice*.

Negative action, as required by law, on the application by the Board of Land and Natural Resources can be expected should the applicant fail to obtain from the County thirty (30) days prior to the 180-day expiration date, one (1) of the following:

1. A determination that the proposed development is outside the Special Management Area (SMA);

2. A determination that the proposed development is exempt from the provisions of the County Ordinance and/or regulation specific to Section 205A-29(b), HRS; or

3. A Special Management Area (SMA) permit for the proposed development.

Staff notes that on April 16, 2010, the County of Kaua'i Planning Department issued the project an exemption from the Special Management Area Rules and Regulations, pursuant to the following definition: 1.4(H)2(b) "Repair or maintenance of roads and highways within existing rights of way."

CONSERVATION CRITERIA:

HAR Section 13-5-30 provides eight specific criteria that the Department or Board shall apply to proposed land uses within the Conservation District. Land uses must conform to the following criteria:

1. *The proposed land use is consistent with the purpose of the conservation district.*

   The purpose of the Conservation District is to conserve, protect, and preserve the important natural resources of the State through appropriate management and use to promote long-term sustainability and the public health, safety, and welfare.

   The proposed action involves repairing the existing roadway in order to provide a safe access for the public. The new revetment will protect the new road embankment from future wave damage.

   In addition, BMPs will be implemented during construction to ensure that the nearshore waters and marine organisms are not adversely affected. The completed project will substantially reduce erosion and subsequent pollution of nearby coastal waters and reef flats.

   The project, through appropriate management, will not substantially degrade coastal resources and will promote the long-term sustainability and the public health, safety, and welfare, and is therefore, consistent with the purpose of the Conservation District.

2. *The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur.*

   The property lies within the Resource subzone. The objective of the Resource subzone is to develop, with proper management, areas to ensure sustained use of the natural resources of those areas.

   The proposed action is an identified land use within the Resource subzone of the Conservation District, according to Chapter 13-5, Hawai'i Administrative Rules (HAR) §13-5-24, R-6, MARINE CONSTRUCTION (D-1) *Marine construction, dredging, filling, or any combination thereof of submerged lands.*

   The proposed action will require dredging for placing the revetment toe, filling with the rock revetment, filling with clean, dredged sand along a 56-foot section at the south end, moving rocks from the nearshore area to use in the revetment, and placing flowable fill to build a road base for road repair.

   The project will reduce erosion of the road embankment, and will not substantially degrade coastal resources. Therefore, it appears the project is consistent with the objective of the Resource subzone.

3. *The proposed land use complies with the provisions and guidelines contained in chapter 205A, HRS, entitled "Coastal Zone Management," where applicable.*

   Recreational Resources: The eroded material from the current road embankment moves south toward the large beach near Anahola Stream. The proposed revetment will prevent erosion, thereby reducing the amount of silt and clay material that could pollute the recreational beach. In addition, reducing erosion of the road embankment will help preserve the nearshore reef flat where limu kohu grows and is picked by local residents.

Staff notes, however, that this CDUA did not include a long-term beach nourishment plan, as required by Condition C of the violation order (**Exhibit 6**).

Historic Resources: No burials or other cultural sites or materials were identified in the project area. Archaeological monitoring will be conducted for all ground altering activities.

Scenic and Open Space Resources: Since the elevation of the roadway and rock revetment is approximately 10 feet below mauka lands, no visual obstructions are expected.

Coastal Ecosystems: The proposed revetment does not extend seaward enough to cover any coral, limu, or fish habitat. The unburied part of the revetment will be dry at low tide. At high tide, some places on the toe will be wet enough so that algae might grow; however, very little algae growth is seen on existing rocks unless they are far enough seaward to be mostly submerged.

BMPs will be implemented during construction to ensure that the nearshore waters and marine organisms are not adversely affected. The project will substantially reduce erosion and subsequent pollution of nearby coastal waters and reef flats.

Economic Uses: 'Aliomanu Road beyond Anahola terminates north of the eroded area, and is the only road access for properties located north of the eroded area; therefore, the project is an important public facility to ensure residents retain access to their properties. Short-term positive impacts are expected from direct and indirect employment and supplies needed to construct the roadway and revetment. Long-term positive impacts are expected by retaining safe, public access for the properties off 'Aliomanu Road.

Coastal Hazards: 'Aliomanu Road is being undermined by shoreline erosion, causing part of the road to collapse into the ocean The project area is within the tsunami inundation area and within the coastal flood zone where storm action can be a hazard. The threat from erosion and coastal flooding is no different from that facing the existing roadway. By replacing the existing, damaged road and including a rock revetment, the potential for damage to the structure and roadway is reduced.

Managing Development: Required permits for the proposed project include: Special Management Area, Shoreline Setback Variance, CDUP, 404 Clean Water Act, and 401 Water Quality Certification.

Public Participation: The public was informed of the project through the Chapter 343, HRS and CDUA process.

Beach Protection: Geotechnical borings were made at both the north and south ends of the project site. At the north end, the soils include silty clay fill to a depth of about 3 feet below ground surface with residual stiff clays and silts below the fill to a depth of 16 feet. The boring at the south end showed clayey silt fill to a depth of 2.5 feet and medium dense beach sand to a depth of 8 feet below the ground surface. Soft basalt was found below the sand. The clay and silt material are not considered a valuable natural resource. The layer of sand at the south end of the project has some value as a beach resource.

The proposed revetment will cover some beach sand especially at the south end where the beach is being eroded. Sand is being washed away as evidenced by the small erosion scarp.

The eroded material from the current road embankment moves south toward the large beach near Anahola Stream. The beach to the south and around Anahola Stream mouth is quite healthy and contains a large quantity of sand that is part of the beach system. The proposed revetment will reduce the amount of non-beach soil from being washed into the ocean, and polluting the recreational beach south of the project area.

As discussed further in the "Discussion" section of the report, Staff believes that the project will not substantially degrade coastal resources.

Marine Resources: It is likely that monk seals, sea turtles, and the Hawaiian hoary bat could be present in the project area. However, the proposed revetment will not cover the rock area where monk seals like to rest. In the event that these endangered species are observed in the project site, within danger of construction activities, construction activities will be stopped. BMPs will be implemented during construction to ensure that the nearshore waters and marine organisms are not adversely affected.

4. *The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.*

Currently, the eroded material from the road embankment moves south toward the large beach near Anahola Stream. The beach to the south and around Anahola Stream mouth is quite healthy and contains a large quantity of sand that is part of the beach system. The proposed revetment will reduce the amount of non-beach soil from being washed into the ocean, and polluting the recreational beach south of the project area.

Staff notes that the proposed project will not have substantial adverse impact to existing natural resources within the surrounding area, community, or region.

5. *The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding area, appropriate to the physical condition and capabilities of the specific parcel or parcels.*

The project does not include any buildings. The proposed road repair and revetment will not change the use of the project area.

'Aliomanu Road beyond Anahola terminates north of the eroded area, and is the only road access for properties located north of the eroded area. The project will repair this important public facility and ensure safe access for the residents on 'Aliomanu Road.

Staff notes the proposed project is compatible with the locality, and surrounding area, and is appropriate to the physical condition and capabilities of the subject parcel.

6. *The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable.*

   Currently, portions of 'Aliomanu Road have been damaged and have collapsed as a result of shoreline erosion. This project will improve the environmental aspects of the land by reducing the embankment erosion and potential water pollution caused by non-beach soil.

   Since the elevation of the roadway and rock revetment is approximately 10 feet below mauka lands, no visual obstructions are expected. There should be little if any change to the natural beauty or open space characteristics.
   Staff notes that the proposed action will preserve and improve on existing physical and environmental aspects of the land.

7. *Subdivision of land will not be utilized to increase the intensity of land uses in the conservation district.*

   The proposed project does not include subdivision.

8. *The proposed land use will not be materially detrimental to the public health, safety, and welfare.*

   The proposed project will restore the site to pre-erosion damaged conditions. The road repairs and rock revetment will allow the roadway to be used again as it was originally intended. The project will positively affect the public health, safety, and welfare by allowing the road to be safe, protected, and accessible.

   Staff notes that the proposed project will not be materially detrimental to the public's health, safety, and welfare.

DISCUSSION:

The 'Aliomanu Road repair project is an identified land use within the Resource subzone of the Conservation District, pursuant to Chapter 13-5, Hawai'i Administrative Rules (HAR) §13-5-24, R-6, MARINE CONSTRUCTION (D-1) *Marine construction, dredging, filling, or any combination thereof of submerged lands.* The CDUA requires Board approval. It is staff's opinion that this proposed action meets the definition of the above cited identified use.

The proposed 'Aliomanu Road repair project involves repair work to a damaged portion of the road and construction of a rock revetment shaped to the design slope, on the seaward side of the roadway. The rebuilt roadway will include a 2-foot wide paved shoulder to pre-erosion conditions. The rebuilt road will be stabilized with a new rock revetment to prevent future erosion of the road.

Hawai'i Coastal Erosion Management Plan

On August 27, 1999, the Board adopted the Hawai'i Coastal Erosion Management Plan (COEMAP) as an internal policy for managing shoreline issues including erosion and coastal development in Hawai'i. COEMAP still serves as the primary shoreline policy for the DLNR and recommends a number of strategies to improve our State's management of coastal erosion

and beach resources. In carrying out this policy, the Department established criteria to guide decision-making over specific cases. The criteria are as follows:

1. Protect/preserve/enhance public shoreline access;
2. Protect/preserve/enhance public beach areas;
3. Protect adjacent properties;
4. Protect property and important facilities/structures from erosion damages; and
5. Apply a "no tolerance" policy for recent or new unauthorized shoreline structures.

The Department considers each case based on its specific circumstance/history. For instance, the quality of the surrounding beach resources, the nature of the surrounding development, and the risk to life and limb are all evaluated to help formulate a position with respect to the appropriate disposition of the matter.

Staff considered the merits of the proposed project with respect to the Department's criteria. In considering the policy, items 1, 2, and 4 are of greatest importance. Items 1 and 2 give precedent to the protection of beaches and shoreline access. However, item 4 gives precedent to the protection of important facilities from erosion hazards, such as 'Aliomanu Road. Staff notes that protection of both resources should be a priority.

In consideration of items 1 and 2, Staff notes that the public has a right of access to and along all beaches and shorelines in the State situated below the "upper reaches of the wash of the waves," pursuant to Hawai'i Revised Statutes (HRS) §115-4 and §115-5. The State's primary role in the shoreline area is to preserve and protect coastal resources within the Conservation District and support public access along and below the shoreline pursuant to HRS Chapter 205A. Therefore, Staff will recommend that the proposed project maintain public access to the shoreline, i.e., by including sufficient area for safe pedestrian access on the road or revetment, and signage along and to the shoreline.

In consideration of item 4, Staff notes that the proposed project would positively affect the public health, safety, and welfare by allowing the road to be safe, protected, and accessible. The project also reduces the potential for damage to the structure and roadway by future erosion hazards.

In order to support COEMAP shoreline policies, Staff considers various management options for beach and conservation projects:

1. Managed Retreat – Allow the beach to function naturally regardless of the cause of erosion or the impacts that shoreline retreat may have upon inland properties.
2. Adaptation – Modify shoreline development patterns and policies to allow erosion to occur naturally without interfering with development improvements.
3. Restoration – Replace sand and natural vegetation within a littoral system
4. Erosion Control – Arrest or shape the pattern of erosion with engineered structures that take into account a specific reach of beach.
5. Shoreline Armoring – Protect specific properties with armoring, such as shore-parallel seawalls and revetments, or with temporary devices such as sandbags.

The proposed project selected shoreline armoring as their preferred alternative. The applicant proposed the rock revetment because it was viewed as the most environmentally-friendly alternative. The rock revetment will reduce wave energy as it passes through voids in the

revetment. The filter lining in the back of the revetment will minimize soil migration to the ocean.

Allowing shoreline retreat in this area would deprive the residents of safe access to their properties north of the eroded area as there is no other means of vehicular access to the area. Adaption and erosion control are not applicable or feasible to this specific situation.

Restoration alone would not have been feasible as a long-term solution for this chronically eroding shoreline area. However, restoration in conjunction with shoreline armoring is a possible option. Staff notes, however, that this CDUA did not include a long-term beach nourishment plan, as required by Condition C of the violation order (**Exhibit 6**).

During the agency and public comment period, few concerns were brought up regarding the project. The applicant notes that archaeological monitoring and BMPs will be implemented during construction.

Staff notes that the project area shoreline has been chronically eroding and receding. With a long-term average annual erosion rate of 0.5 feet per year, it is unlikely that a sandy beach will return to the project area without significant beach nourishment activities. Long-term erosion has consumed the beach fronting the project area as well as much of the sandy beach on and around Kuaehu Point.

In response to the erosion problems, the County of Kaua'i, without prior authorization, moved rocks to protect 'Aliomanu Road from coastal erosion damage. As a result, the County of Kaua'i was notified of the violation and fined. The County of Kaua'i paid the fine and proposed a temporary emergency repair of the road damage until a permanent repair could be designed. The temporary emergency repair consisted of placing coir (coconut fiber) sandbags along 200 feet of the eroded roadway.

Coastal erosion occurs as a result of the following phenomena: 1) Seasonal changes in waves and currents that remove sand from the system; 2) Long-term (chronic) erosion due to fluctuations in meteorological or oceanographic processes such as sea level rise; and 3) Human impacts to sand availability through sand impoundment and supply disruption.

Development on beaches and dunes has caused serious erosion of these areas, resulting in loss of recreational areas, habitat, and the storm protection that beaches, dunes and natural processes have provided. Beach narrowing and loss, and shoreline hardening (the construction of vertical seawalls or sloping stone revetments along a shoreline to protect coastal lands from marine erosion), also severely restrict public access to State Conservation land and the natural resources. In heavily armored sectors, sand impoundment mauka of walls can lead to general sand volume decreases causing or exacerbating sector-wide erosion trends.

Unfortunately, many of Hawai'i's beaches have been degraded or lost from a combination of natural erosion and inappropriate coastal development including inappropriate shoreline armoring, shallow lot shoreline subdivisions, and development built too close to the shoreline.

Staff notes that the erosion occurring along this particular stretch of coastline is due to natural and anthropogenic causes. 'Aliomanu forms a small eastern facing headland, which has been undergoing erosion. This process has likely been accelerated by the construction of the

'Aliomanu seawall, located approximately 300-400 feet north of the subject roadway segment, but is likely influencing erosion rates to the south.

The project area is in the natural transition from sandy beach to rocky and clay headland. The local substrate beneath the threatened roadway, and to the south along the erosion scarp at the mauka side of the beach is comprised of sand and rock. The beach fronting the project area has already been consumed by erosion.

The sandy beach continues to hold its place along the coastline to the south of the project area and experiences long-term accretion closer to and makai of the mouth of the Anahola River. Though the beach to the south, fronting the Anahola Stream mouth is accreting, it appears that the littoral cell (sediment system) for the project area does not have sufficient sediment to maintain any beach fronting the project area. The natural progression for this area is continued erosion of the clay and rock substrate, exposing a low-sloped, shallow marine platform.

As the coastal plain is not comprised of beach quality sand, impoundment of the material behind a shoreline armoring structure will not deprive the local sediment system of beach quality material. Converting the coastline from an eroding clay and rock erosion scarp to an armored coast will slow erosion, but will not have a significant effect on beach processes, as they have already been lost in the area. As there is no sand source mauka of the project, no future sediment is being lost to the system either.

Emplacement of a revetment is preferable to vertical or grouted structures, as revetments have superior wave energy dissipation characteristics. In addition, Staff will recommend that the proposed project maintain public access to the shoreline, i.e., by including sufficient area for safe pedestrian access on the road or revetment, and signage along and to the shoreline.

FINDINGS:

1. There is an imminent threat to the roadway with active erosion that will lead to failure;

2. 'Aliomanu Road is the only access to the residential community to the north;

3. That the proposed action is located within the State Land Use Conservation District, Resource subzone, as evidenced by the wash of the waves;

4. The proposed action is intended to provide permanent protection to the threatened roadway;

5. The proposed action does provide benefit to the public; and

6. That the proposed action is not expected to create harm to the land and natural resources.

As such, Staff recommends the following:

RECOMMENDATION:

Staff recommends that the Board of Land and Natural Resources **APPROVE CDUA KA-3562** for the 'Aliomanu Road Repair Project, subject to the following terms and conditions:

1. The applicant shall comply with all applicable statutes, ordinances, rules, and regulations of the Federal, State, and County governments, and applicable parts of Chapter 13-5, HAR;

2. The applicant shall obtain an appropriate land disposition approval for the work, i.e., a Right of Entry from the State Land Division Kaua'i District Office (808-274-3491);

3. The applicant, its successors and assigns, shall indemnify and hold the State of Hawai'i harmless from and against any loss, liability, claim or demand for property damage, personal injury or death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors and agents under this action or relating to or connected with this action;

4. The applicant shall comply with all applicable Department of Health administrative rules;

5. The applicant shall submit a long-term beach nourishment plan, as required by Condition C of the prior violation order (**Exhibit 5**), to the OCCL for review and approval prior to commencement of any work;

6. The applicant shall maintain public access to the shoreline, i.e., by including sufficient area for safe pedestrian access on the road or revetment, and signage along and to the shoreline;

7. Any work or construction to be done on the land shall be initiated within one (1) year of the approval of such use, in accordance with construction plans that have been signed by the Chairperson, and, unless otherwise authorized, shall be completed within three (3) years of the approval of such use;

8. All representations relative to mitigation set forth in the accepted environmental assessment for the proposed use are incorporated as conditions of the permit;

9. The applicant understands and agrees that the permit does not convey any vested right(s) or exclusive privilege;

10. Work shall be conducted during calm weather periods to the most practical extent possible and no work shall occur if there is high surf or ocean conditions that will create unsafe work or beach conditions;

11. The applicant shall implement Best Management Practices (BMPs) and an approved monitoring and assessment plan to minimize dirt and silt from entering the ocean through silt containment devices or barriers, and to contain and clean up fuel, fluid, or oil spills immediately for this project. Any spill(s) or other contamination(s) that occur at the project site will be reported immediately to the Department of Health and other appropriate agencies;

12. All placed material shall be free of contaminants of any kind, including: excessive silt, sludge, anoxic or decaying organic matter, turbidity, temperature or abnormal water chemistry, clay, dirt, organic material, oil, floating debris, grease or foam, or any other pollutant that would produce an undesirable condition to the beach or water quality;

13. Appropriate safety and notification procedures shall be carried out. This shall include high visibility safety fencing, tape or barriers to keep people away from the active construction site, and a notification to the public informing them of the project;

14. Provisions shall be made if access is cut off for emergency vehicles. If access is compromised, notification to Police Dispatch and local Fire Station should be made;

15. Where any interference, nuisance, or harm may be caused, or hazard established by the use, the applicant shall be required to take measures to minimize or eliminate the interference, nuisance, harm, or hazard within a time frame and manner prescribed by the Chairperson;

16. The project shall not adversely affect a Federally listed threatened or endangered species or a species proposed for such designation, or destroy or adversely modify its designated critical habitat;

17. The project shall not substantially disrupt the movement of those species of aquatic life indigenous to the area, including those species, which normally migrate through the area;

18. Should the Chairperson be notified by the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Department, or the public that the proposed action deviates from the scope of the project, or activities are adversely affecting fish or wildlife resources or their harvest, the Chairperson will direct the applicant to undertake corrective measures to address the condition affecting these resources. The applicant must suspend or modify the activity to the extent necessary to mitigate or eliminate the adverse effect;

19. The applicant acknowledges that the approved work shall not hamper, impede or otherwise limit the exercise of traditional, customary or religious practices in the immediate area, to the extent such practices are provided for by the Constitution of the State of Hawai'i, and by Hawai'i statutory and case law;

20. Archaeological monitoring shall be conducted for all ground-altering activities, including removal of sand or fill. An archaeological monitoring plan shall be submitted to SHPD for review and approval prior to the start of any ground-altering activities; and an archaeological monitoring report shall be submitted for review and approval within 180 days of the completion of monitoring;

21. Should historic remains such as artifacts, burials or concentration of charcoal be encountered during construction activities, work shall cease immediately in the vicinity of the find, and the find shall be protected from further damage. The contractor shall immediately contact SHPD (808-692-8015), which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary;

22. Other terms and conditions as prescribed by the Board; and

23. Failure to comply with any of these conditions shall render this Conservation District Use Permit void.

Respectfully Submitted,

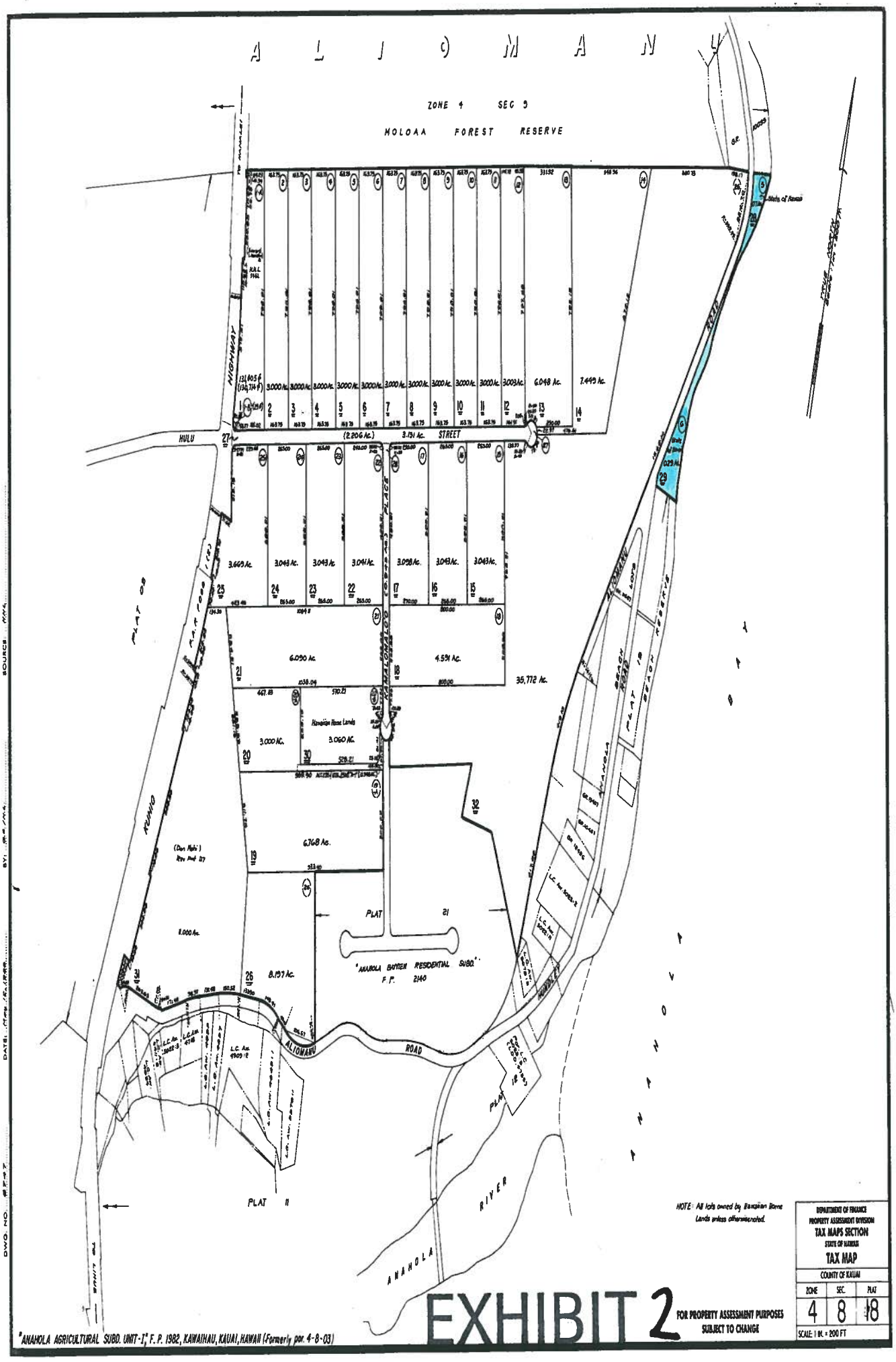
Audrey Barker, Staff Planner
Office of Conservation and Coastal Lands

Approved for Submittal:

By: _____
William J. Aila, Jr., Interim Chairperson
Board of Land and Natural Resources


PAPAA RD
KALALEA VIEW DR
KUHIO HWY
ALIOMANU RD
HUI RD
Anahola
'Aliomanu Road Repair Site
Anahola Bay
HOKUALELE RD
KAMALOMALOO RL
ALIOMANU RD
Anahola Bay
ANAHOLA RD
MAHUAHUA RD
KUKUIHALE RD
KEALIA RD
KALALEA RD
KAWELO ST
KONONA RD
MAKAIO RD
MANAMANA RD

EXHIBIT 1



NOTE: All lots owned by Hawaiian Home Lands unless otherwise noted.

DEPARTMENT OF FINANCE
PROPERTY ASSESSMENT DIVISION
TAX MAPS SECTION
STATE OF HAWAII

TAX MAP

COUNTY OF KAUAI

ZONE	SEC.	PLAT
4	8	18

SCALE: 1 IN. = 200 FT

EXHIBIT 2

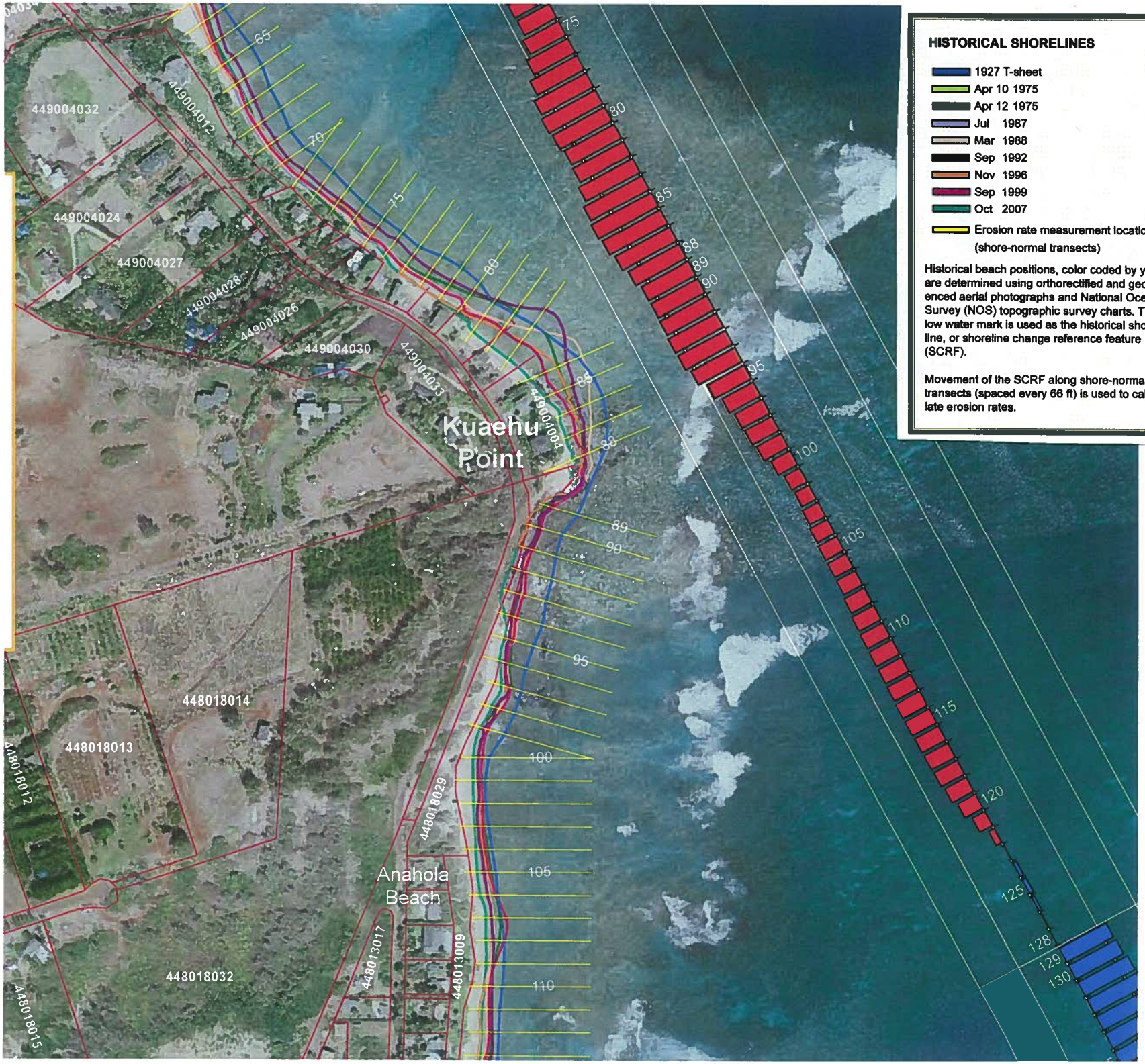
FOR PROPERTY ASSESSMENT PURPOSES
SUBJECT TO CHANGE

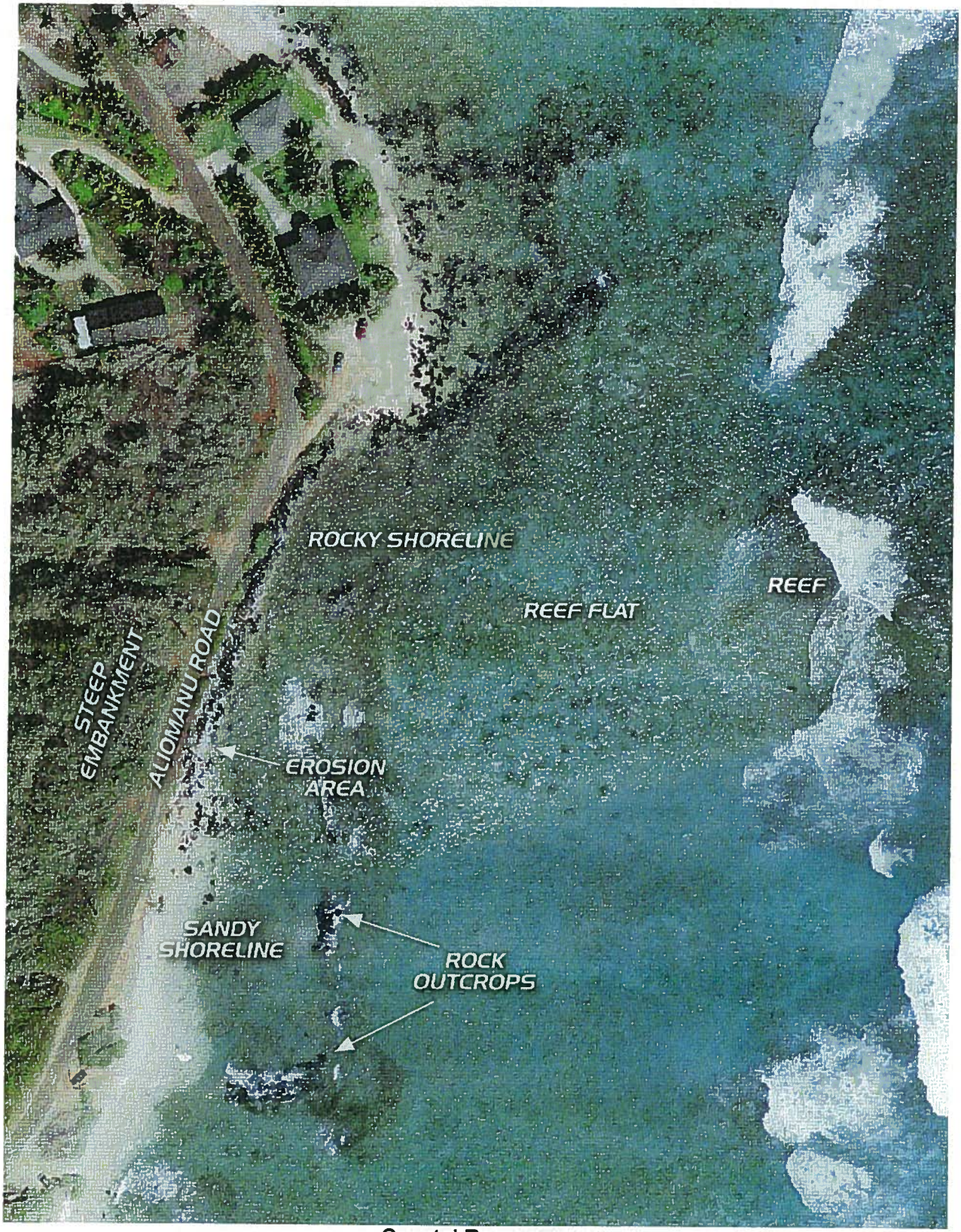
"ANAHOLA AGRICULTURAL SUBD. UNIT-1," F. P. 1982, KAWAIHAU, KAUAI, HAWAII (Formerly por. 4-8-03)

SOURCE: MAP
BY: [illegible]
DATE: [illegible]
DWG. NO. [illegible]

EXHIBIT 3

EXHIBIT 4


HISTORICAL SHORELINES
1927 T-sheet
Apr 10 1975
Apr 12 1975
Jul 1987
Mar 1988
Sep 1992
Nov 1996
Sep 1999
Oct 2007
Erosion rate measurement locations (shore-normal transects)
Historical beach positions, color coded by year, are determined using orthorectified and georeferenced aerial photographs and National Ocean Survey (NOS) topographic survey charts. The low water mark is used as the historical shoreline, or shoreline change reference feature (SCRF).
Movement of the SCRF along shore-normal transects (spaced every 66 ft) is used to calculate erosion rates.
Kuaehu Point
Anahola Beach
449004032
449004012
449004024
449004027
449004028
449004026
449004030
449004033
449004004
448018014
448018013
448018012
448018029
448018032
448018015
448013017
448013009



Coastal Resources

EXHIBIT 5

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND ENVIRONMENTAL AFFAIRS

POST OFFICE BOX 621

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

MAR 29 2004

RECEIVED
LAND DIVISION
2004 APR -2 A 9:40
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

Ref.:PB:SL

The Honorable Ladye Martin, County Engineer
County of Kauai
Public Works Department
4444 Rice Street
Lihue, Hawaii 96766

This is to inform you that on March 25, 2004, the Board of Land and Natural Resources found the County in violation of Chapter 183C, Hawaii Revised Statues for an unauthorized boulder structure at Aliomanu, Island of Kauai, and ordered the following:

A. That the Board of Land and Natural Resources imposed a fine of $2,000 for the boulder structure, pursuant to Chapter 183C, HRS;

B. That the County of Kauai shall pay the fine within sixty (60) days of the date of the Board's action;

C. That the County of Kauai shall either remove the structure or submit a completed Conservation District Use Application for the unpermitted boulder structure within sixty (60) days of the Board's action and shall diligently pursue the CDUA permit within the time frames stipulated in Chapter 183C, Hawaii Revised Statutes. The application for an after-the-fact shoreline structure shall include a long-term beach nourishment plan for the area impacted by the structure;

D. If the fines are not paid in accordance with conditions A and B, a fine of $2,000 per day shall accrue on the County of Kauai until this condition is met; and

E. That in the event of failure of the County of Kauai to comply with items A, B, and C, the matter shall be turned over to the Attorney General for disposition, including all administrative costs.

EXHIBIT 6

Should you have any questions on any of these conditions, please feel free to contact me at 587-0381.

Sincerely,

SAMUEL J. LEMMO, Administrator
Office of Conservation and Coastal Lands

Receipt acknowledged:

Signature

Date 7/30/04

cc: Chairperson
Kauai Board Member
Kauai Land Agent
DOCARE
County of Kauai
Department of Planning
Honorable Mayor Baptiste
Russell Sugano

EXHIBIT 6

Emergency
KA-08-02b.

DE

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innovation through engineering & scientific excellence

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2008 JUL 31 A 11: 21

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

July 29, 2008

Mr. Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Subject: Revised Temporary Emergency Repair of Aliomanu Road, Anahola, Kauai, TMK: (4) 4-8-018:028, 029

Dear Mr. Lemmo:

Oceanit sent plans and information for emergency repair of Aliomanu Road dated January 16, 2008. At that time we proposed a system of gabions, sandbags, and rocks for emergency repair. We were informed by the U.S. Army Corps of Engineers and the State Department of Health that the proposed system was unacceptable and that we were to use coir sandbags. We re-designed the shore protection system to use the bags. The Corps is processing a Nationwide 13 Bank Stabilization permit and DOH is reviewing a 401 Water Quality Certification for the sandbag bank stabilization. The new design plans are enclosed.

The following information is similar to that we previously submitted.

The County of Kauai ("County") received a notice of violation from the Office of Conservation and Coastal Lands dated March 29, 2004 for an unauthorized boulder structure at Aliomanu, Island of Kauai. The violation letter directed that "The County of Kauai shall either remove the structure or submit a completed Conservation District Use Application for the unpermitted boulder structure within sixty (60) days of the Board's action....." Oceanit has received photographs of the violation area from Dolan Eversole of your staff.

The County had planned to restore the area to its natural/original condition; however, high surf caused additional erosion of the coastline, collapse of the embankment, and damage to Aliomanu Road, which runs along Anahola Bay (see attached photos and topographic map).

At the eroded embankment, Aliomanu Road is no longer safe for vehicles. Barriers have been erected and one-lane traffic only is possible. The primary reason for repair is the imminent threat to public health and safety. A vehicle could easily miss the edge of the road at night or could go off the road if the

EXHIBIT 7

Oceanit Center 828 Fort Street Mall, Suite 600 Honolulu, Hawaii 96813 Phone: 808.531.3017 Fax: 808.531.3177

undermined shoulder and pavement collapsed. The road is the only access for residents living just to the north along the coast. It is also the only access for emergency vehicles. The only options are building a new road at another location or building a stream bridge to reach roads at neighboring areas. Both options would be much more expensive.

Therefore, the County proposes to repair wave erosion damage to Aliomanu Road and the embankment. The repair will be done in two steps. The first step is a temporary emergency bank stabilization with coir bags that will be maintained until plans and permits can be obtained for the second step, a permanent repair of the road embankment with a seawall and rock toe or possibly with a rock revetment and reconstruction of the damaged road. Kauai County is evaluating several options.

The sandbags will be filled with sand from the DHHL area at the Anahola Stream mouth berm. A 401 Water Quality Certification application with a BMP and water quality monitoring plan is being evaluated by DOH.

On behalf of Kauai County, Oceanit would like to request emergency authorization for the County to place coconut fiber (coir) sandbags as temporary bank stabilization structures along a 200-foot section of the eroding embankment. The sandbags would be placed seaward of the shoreline as located on September 20, 2007 (see attached plans). When permanent repairs are made, the sandbags will be removed.

The County will apply for a Conservation District Use Permit and prepare an environmental assessment (EA) for the permanent repair. The permanent design concept will probably incorporate some or all of the existing rocks previously placed. Historical aerial photos show rocks scattered widely over the beach and nearshore area along the now damaged section of the road. Many of these rocks have rolled down the steep hillside mauka of the road over the years and are not man-placed.

The County also plans to apply for a Department of the Army permit, a 401 Water Quality Certification, and for an SMA and Shoreline Setback Variance for the permanent repair.

EXHIBIT 7

Attached for your review is a concept plan of the emergency repair. Also attached are aerial and ground photos of the location and damage. Please let us know what additional information you may need to grant the requested authorization. If you have questions, please me at (808) 531-3017. You may also contact the County Engineer, Mr. Donald Fujimoto, at (808) 241-6600.

Sincerely,

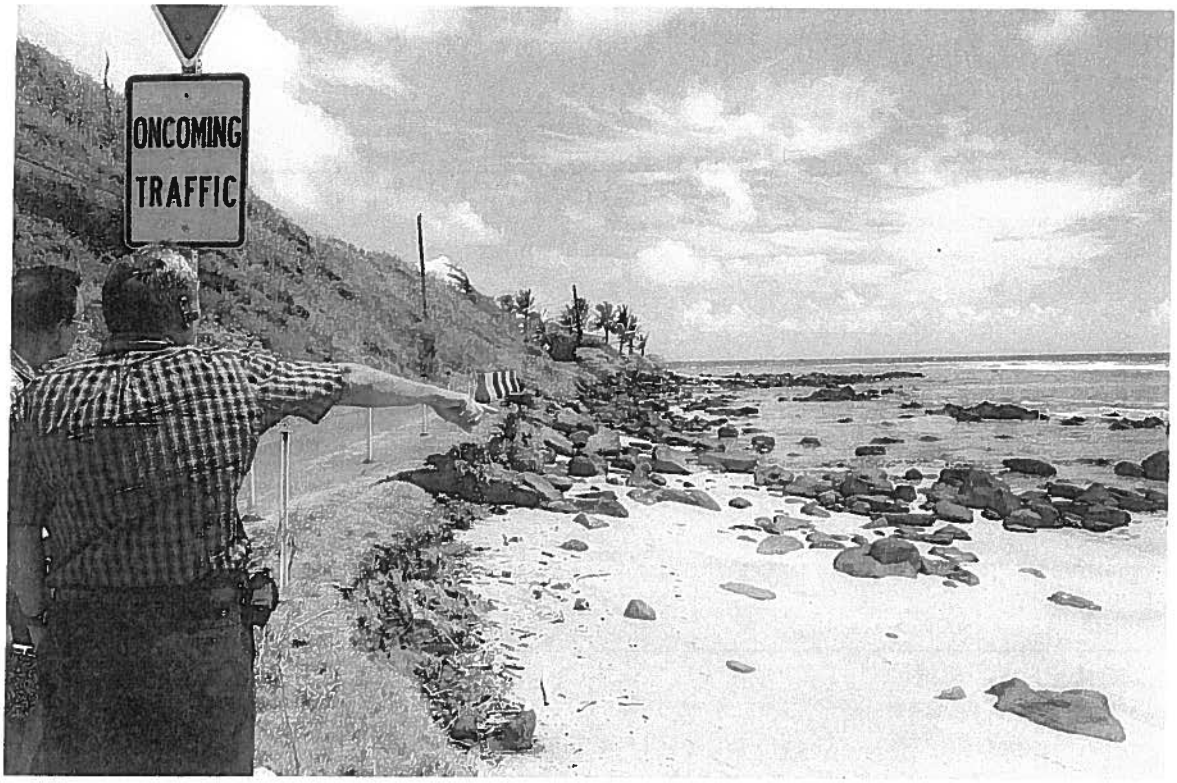
Warren E. Bucher

Warren E. Bucher, Ph.D., P.E.
Senior Engineer

Attachments

cc: County of Kauai DPW

EXHIBIT 7



Aliomanu Road Erosion Area

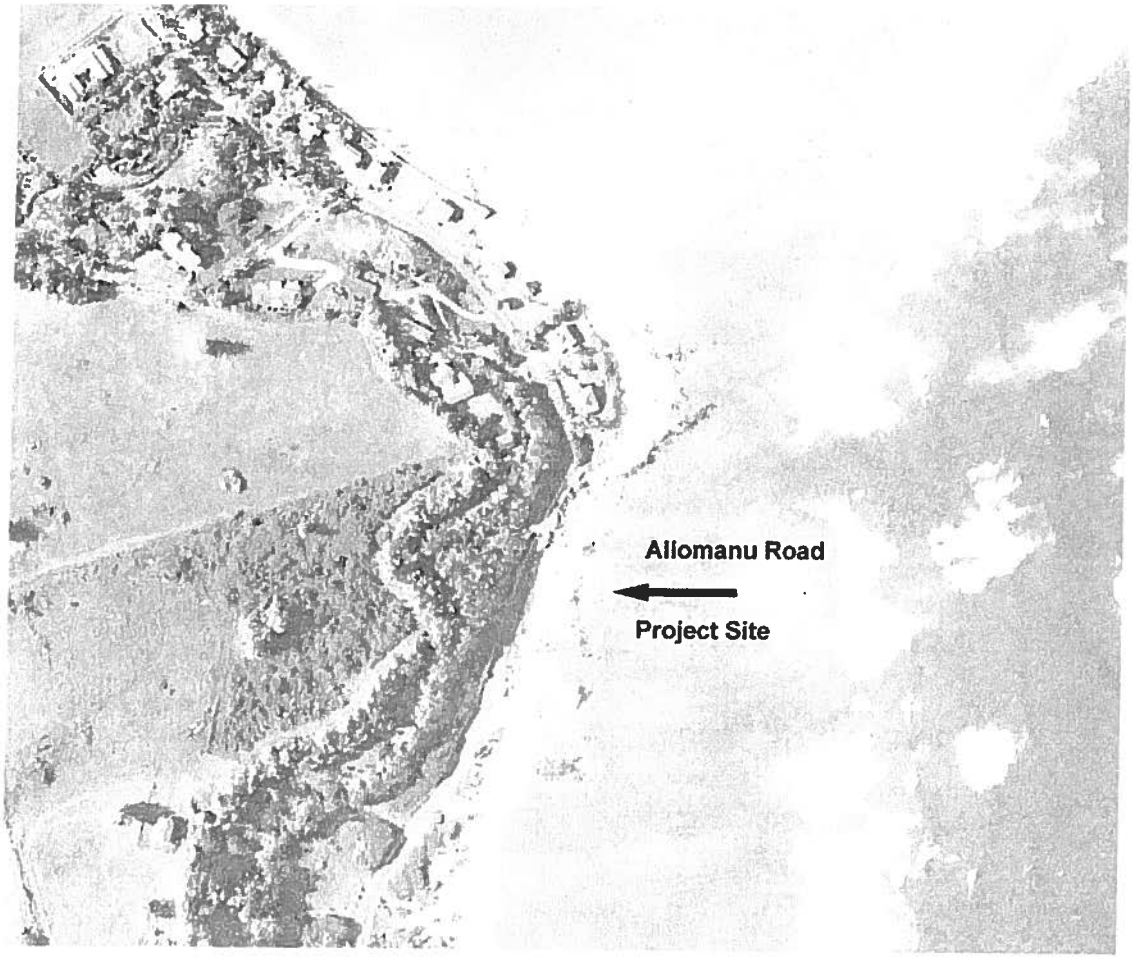
Aliomanu Road Erosion Area Detail

EXHIBIT 7

oceanit
innovation through engineering & scientific excellence

Rocks Offshore from Erosion Area

EXHIBIT 7



Aliomanu Road Project Aerial Photograph

EXHIBIT 7

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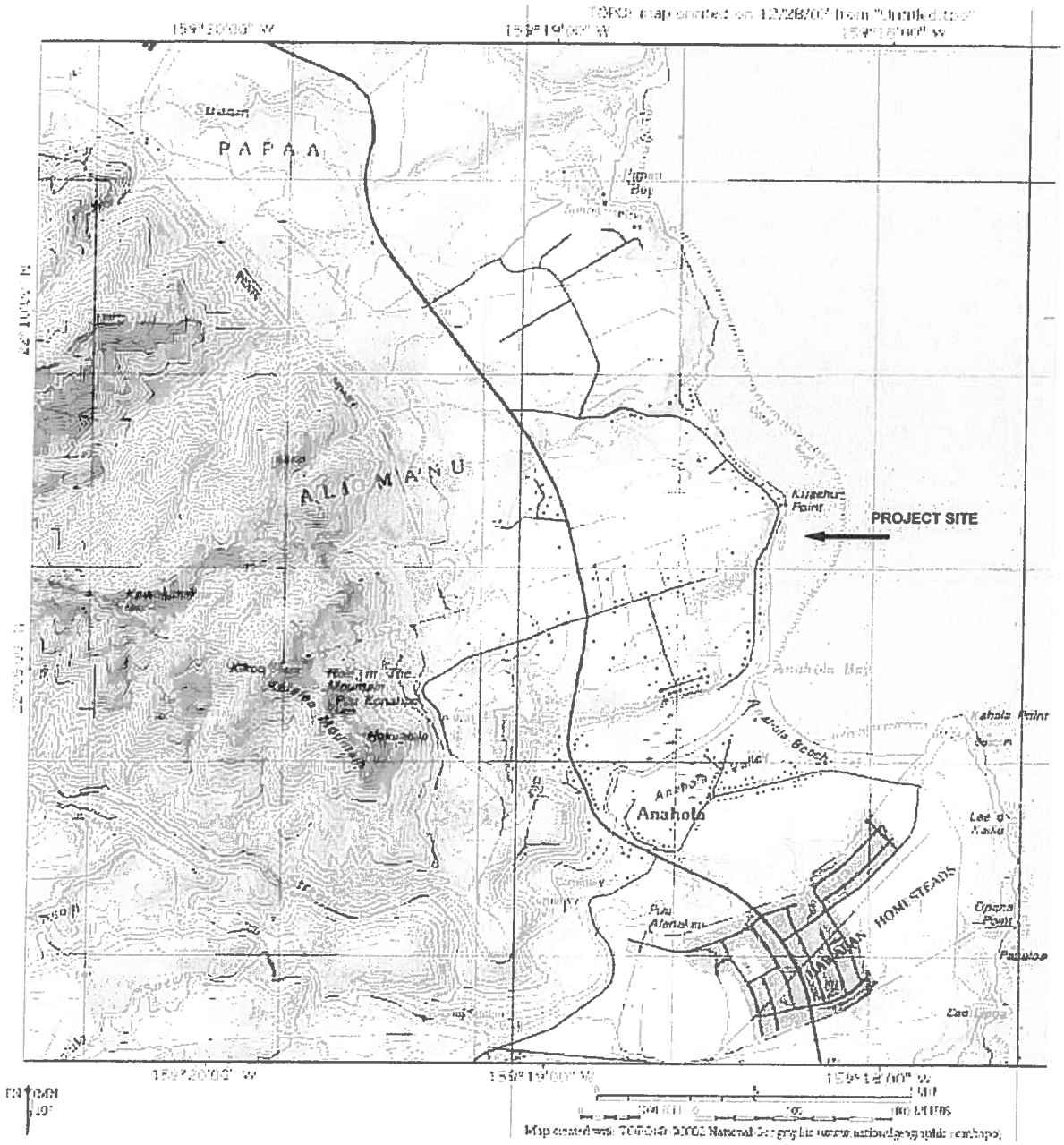
innovation through engineering & scientific excellence



USGS Topo Map of Project Site

EXHIBIT 7

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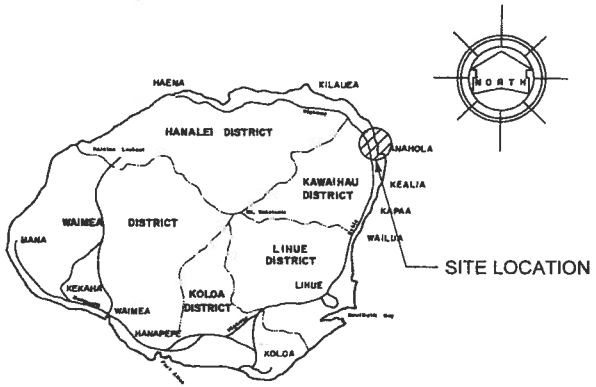


ISLAND OF KAUAI

DEPARTMENT OF PUBLIC WORKS

COUNTY OF KAUAI

CONSTRUCTION DRAWINGS

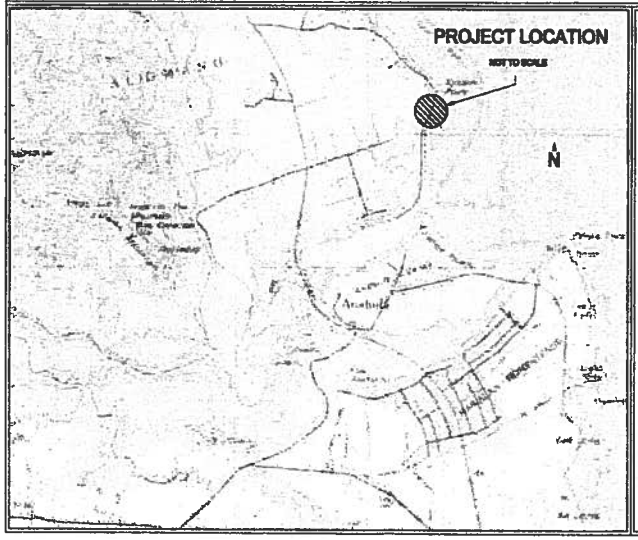
FOR

ALIOMANU ROAD TEMPORARY REPAIR

ANAHOLA, KAWAIHAU

PLANS PREPARED BY:

OCEANIT



INDEX TO DRAWINGS

APPROVED:

County Engineer, Dept. of Public Works
County of Kauai — Date 6/26/08

Director, Planning Department
County of Kauai — Date 6/26/08

Chief, Environmental Management Division
Department of Health, State of Hawaii — Date

EXHIBIT 7

SANDBAG CONSTRUCTION NOTES

1. ALL WORK TO BE DONE IN ACCORDANCE WITH THE COUNTY OF HAWAII, "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION" DATED DEC. 1984 AND "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" DATED SEPT. 1986.
2. SANDBAGS SHALL BE COIR (COCONUT FIBER) BAGS. EACH BAG SHALL BE 24" x 37" WHEN EMPTY. FILL EACH BAG WITH 700–800 POUNDS OF APPROVED SAND. THE BAGS MAY BE FILLED AT THE SAND SOURCE IF APPROVED BY THE ENGINEER AND LAND OWNER.
3. THE SANDBAGS SHALL BE WRAPPED IN COIR MATTING FOR REINFORCEMENT. A GEOTEXTILE FILTER SHALL BE PLACED BEHIND AND BELOW THE BAGS TO PREVENT SOIL FROM PIPING THROUGH FROM THE ERODED EMBANKMENT.
4. SANDBAGS SHALL BE PLACED TO FIT THE EXISTING BANK CONTOURS AT THE TIME OF CONSTRUCTION. BAGS SHALL NOT BE STACKED AT A SLOPE STEEPER THAN 1V TO 1.5H. THE VOLUME OF THE BAG REVETMENT SHALL NOT EXCEED 1 CUBIC YARD PER LINEAR FOOT. THE STRUCTURE SHALL NOT EXCEED A LENGTH OF 200 FEET.
5. EXCAVATE A FOOTING FOR THE BOTTOM LAYER OF BAGS AS SHOWN ON THE PLANS. EXCAVATED MATERIAL SHALL BE REMOVED TO A LOCATION APPROVED BY THE ENGINEER. IT SHALL NOT BE PLACED ON THE BEACH OR IN THE WATER. REMOVE ROCKS FROM THE SANDBAG PLACEMENT AREA AND PLACE THEM SEAWARD OF THE REVETMENT TOE. DO NOT REMOVE ROCKS THAT ARE EMBEDED IN THE ERODING EMBANKMENT.
6. THE CONTRACTOR SHALL MAINTAIN ONE TRAFFIC LANE FOR LOCAL TRAFFIC. ALIOMANU ROAD SHALL NOT BE CLOSED WITHOUT PERMISSION FROM THE ENGINEER. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", AND TO THE SATISFACTION OF THE ENGINEER.
7. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, AND SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF SAME IN THE EVENT OF DAMAGES DUE TO HIS CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY COMPANIES. PERSONAL INJURY RESULTING FROM CONTACT WITH EXISTING UTILITIES SHALL BE THE CONTRACTORS RESPONSIBILITY.
8. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE COUNTY'S INSPECTOR FOR DIRECTION.

PUBLIC HEALTH SAFETY AND CONVENIENCE NOTES

1. CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.
2. THE CONTRACTOR AT HIS/HER EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM RUBBISH, DUST, NOISE, EROSION, ETC. THE WORK SHALL BE DONE IN CONFORMANCE WITH THE AIR AND WATER POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.
3. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SILT OR DEBRIS IN ANY FORM TO FALL SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATION OCCUR, THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS AS NECESSARY.
4. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.
5. THE CONTRACTOR'S ATTENTION IS DIRECTED TO CHAPTER 46, PUBLIC HEALTH REGULATIONS, DEPARTMENT OF HEALTH, STATE OF HAWAII, "COMMUNITY NOISE CONTROL," IN WHICH MAXIMUM PERMISSIBLE NOISE LEVELS HAVE BEEN SET. IF THE CONSTRUCTION WORK REQUIRES A PERMIT FROM THE DIRECTOR OF HEALTH, THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 46 AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS AND THE PROCEDURES FOR OBTAINING A PERMIT FOR THE CONSTRUCTION ACTIVITIES. APPLICATION AND INFORMATION ON VARIANCES ARE AVAILABLE FROM THE ENVIRONMENTAL PROTECTION AND HEALTH SERVICES DIVISION, 1250 PUNCHBOWL ST., HONOLULU, HI 96813 OR BY TELEPHONE (548–8435).
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF CHAPTER 54, WATER QUALITY STANDARDS, AND CHAPTER 55, WATER POLLUTION CONTROL, OF TITLE 11, ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH. THE CONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF THE BEST MANAGEMENT PRACTICES PLAN (BMP) FOR THE PROJECT.
7. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION ACTIVITY SO AS TO CAUSE FALLING ROCK, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATER COURSES. SHOULD SUCH VIOLATIONS OCCUR, THE COSTS INCURRED FOR ANY REMEDIAL ACTION SHALL BE PAYABLE BY THE CONTRACTOR.

REVISION	DATE	SHEET	MADE BY	APPROVED

oceanit

DEPARTMENT OF PUBLIC WORKS
COUNTY OF KAUAI

ALIOMANU ROAD TEMPORARY REPAIR

GENERAL NOTES

DWG. NO. T-2
SHEET NO. 2 OF 4

ALIOMANU ROAD TEMPORARY REPAIR

EXHIBIT 7

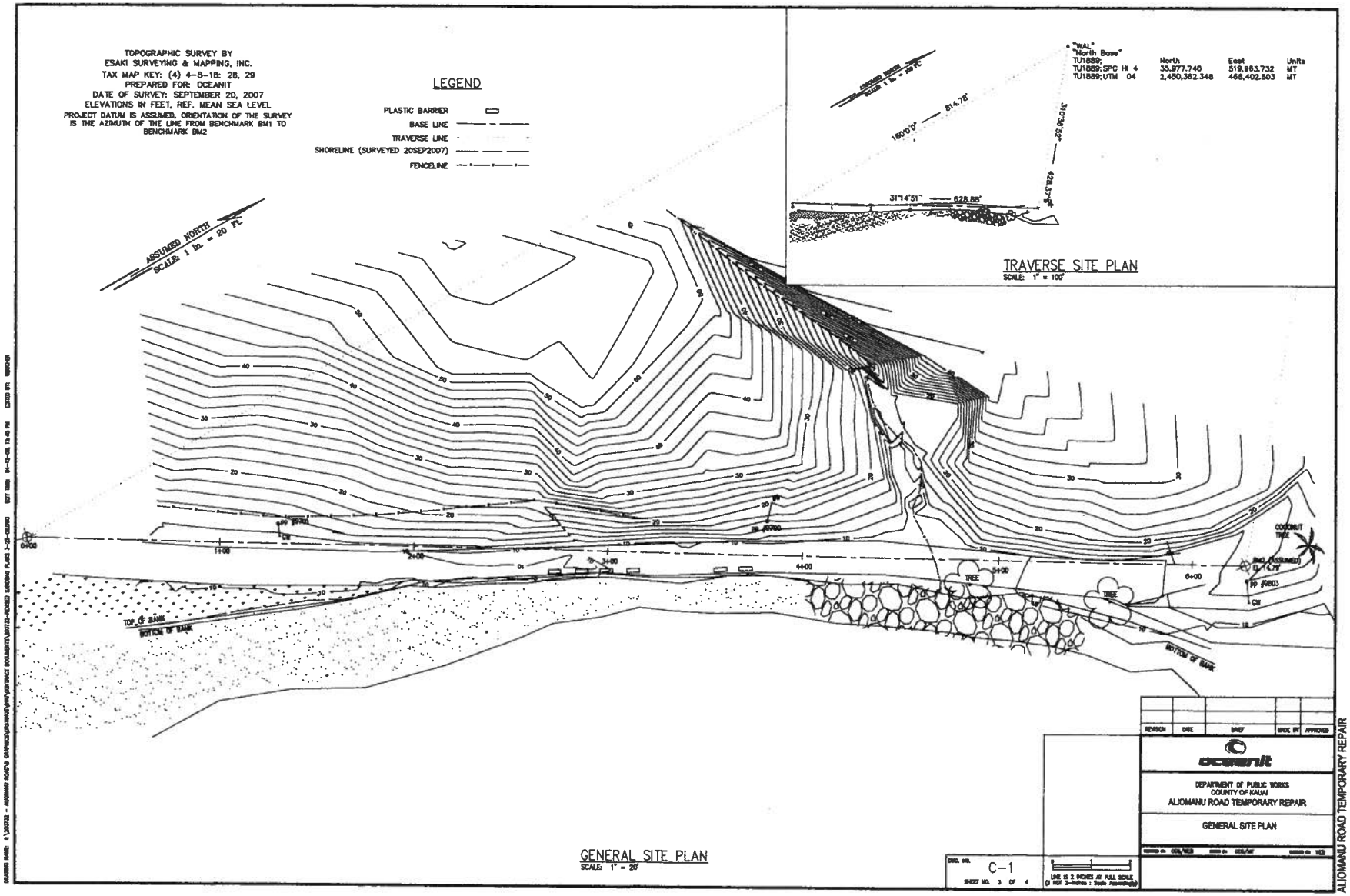
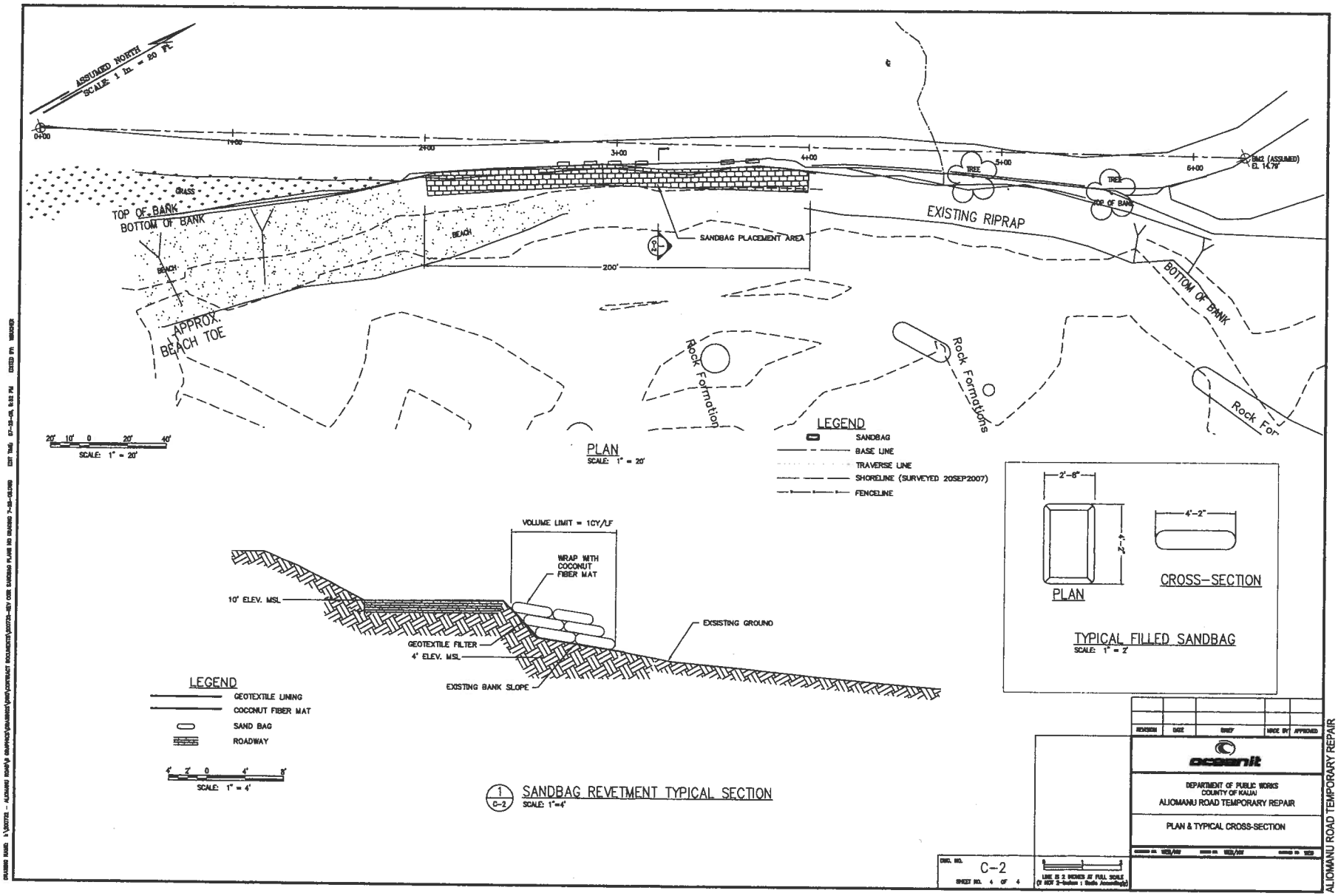

TOPOGRAPHIC SURVEY BY
ESAKI SURVEYING & MAPPING, INC.
TAX MAP KEY: (4) 4-8-18: 28, 29
PREPARED FOR: OCEANIT
DATE OF SURVEY: SEPTEMBER 20, 2007
ELEVATIONS IN FEET, REF. MEAN SEA LEVEL
PROJECT DATUM IS ASSUMED, ORIENTATION OF THE SURVEY IS THE AZIMUTH OF THE LINE FROM BENCHMARK BM1 TO BENCHMARK BM2
LEGEND
PLASTIC BARRIER
BASE LINE
TRAVERSE LINE
SHORELINE (SURVEYED 20SEP2007)
FENCELINE
ASSUMED NORTH
SCALE: 1 in. = 20 Ft.
"WAL" "North Base" TU1889; TU1889;SPC HI 4 TU1889;UTM 04
North 35,977.740 2,450,382.348
East 519,983.732 468,402.803
Units MT MT
180°0'0" 814.78'
310°36'-20"
428.37'
31°14'51" 528.88'
TRAVERSE SITE PLAN
SCALE: 1" = 100'
0+00
1+00
2+00
3+00
4+00
5+00
6+00
TOP OF BANK
BOTTOM OF BANK
TREE
COCONUT TREE
ENG. (ASSUMED)
GENERAL SITE PLAN
SCALE: 1" = 20'
oceanit
DEPARTMENT OF PUBLIC WORKS
COUNTY OF KAUAI
ALIOMANU ROAD TEMPORARY REPAIR
GENERAL SITE PLAN
DWG. NO. C-1
SHEET NO. 3 OF 4
ALIOMANU ROAD TEMPORARY REPAIR

EXHIBIT 7



1 / C-2 SANDBAG REVETMENT TYPICAL SECTION
SCALE: 1"=4'

REVISION	DATE	BY	MADE BY	APPROVED

oceanit

DEPARTMENT OF PUBLIC WORKS
COUNTY OF KAUAI
ALIOMANU ROAD TEMPORARY REPAIR

PLAN & TYPICAL CROSS-SECTION

DWG. NO. C-2
SHEET NO. 4 OF 4

LINE IS 2 INCHES AT FULL SCALE
(IF NOT 2-Inches : Scale Accordingly)

ALIOMANU ROAD TEMPORARY REPAIR

EXHIBIT 7

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
Office of Conservation and Coastal Lands
POST OFFICE BOX 621
HONOLULU, HAWAI'I 96809

DLNR:OCCL:.DE

File No.: Emergency-KA-08-02

August 12, 2008

Mr. Warren Bucher
Oceanit, Senior Engineer
828 Front Street Mall, Suite 600
Honolulu, HI 96813

Mr. Bucher:

SUBJECT: Emergency Road Repair (Sandbags), Aliomanu Road, Anahola, Kauai, Hawaii
TMK (4) 8-018:028, 029

The Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) has received your letter dated July 29, 2008 regarding an emergency request for a coconut fiber (Coir) sand bag revetment and Coir blanket wrap with a geotextile filter cloth fronting portions of Aliomanu Road. Based on the information presented and previous site visits by our staff, the existing roadway is in danger of collapse from chronic coastal erosion without immediate shore protection and justifies a temporary emergency response (Figure 1).

As a temporary emergency measure, the County of Kauai proposes to install an engineered Coir sandbag revetment along 200 feet of the road (Figure 2). The sandbags will be installed in a sloping revetment orientation, abutting the makai side of the road. The revetment will be no more than 200 feet long, not exceed a 1V:1.5H slope and consist of 488 bags for a total sand volume of about 160 cy. Each bag will be Coir material 54" x 37" when empty and estimated to weigh 700-800 pounds once filled. The sand bags will be slurry filled on site with clean beach sand from the Anahola River mouth (pending final approval from the landowner). Previous inspection and use of this sand source for a similar project in the area 3 years ago indicates it meets the state standards and is of acceptable quality. Sand fill will be placed within the sand bags as a slurry in accordance with the submitted construction notes (Figure 3). A geotextile filter cloth will be placed mauka of the revetment to retain the backfill material between the erosion scarp and the sandbags.

Mitigation Measures (Best Management Practices)

Typical Best Management Practices shall be implemented to ensure that water quality and marine resources are protected and preserved. Mitigation measures involve the use of sand that is free of contaminants and low in silt content. The applicant proposes to place the sandbags seaward of the shoreline and will ensure silt is contained during construction activities. Excessive silt and turbidity shall be contained or otherwise minimized through the use of silt containment devices and barriers or other adequate measure to control silt and return water runoff. Silt containment shall be

EXHIBIT 8

practiced for the duration of construction activities and in accordance with Department of Health, Clean Water Branch (DOH) standards. The sandbag installation should occur during low tide to ensure activities do not discharge silt into state waters. Visual monitoring of the nearshore water quality condition should be practiced during sand placement; and if excessive turbidity occurs, sand placement shall stop and more effective silt containment measures utilized.

Sand Quality

Due to the contained use of the proposed sand, the current erosion of the existing clay bank, DOH approved Best Management Practices, low silt content, limited duration of exposure and the high rate of flushing and circulation at the site, potential turbidity impacts from the proposed activities are estimated to be negligible. Near-shore turbidity associated with the use of this sand is not expected to exceed existing background levels. In addition the DOH has granted a conditional approval of a Water Quality certificate (WQC 0000741) Section 401 for the project on August 7, 2008 and has approved the proposed BMP's, DQO's and monitoring, assessment and work plans.

Based on the information provided, the DLNR has made the following determinations:

1. There is an imminent threat to the roadway with active erosion that will lead to failure.
2. Aliomanu Road is the only access to the residential community to the north.
3. Relocation of the roadway has been considered and is impractical in the short timeframe required to retain access to the surrounding community.
4. This berm is approximately defined by the active scarping and eroded sediment. Erosion appears to have accelerated landward in the last year.
5. The proposed structure will provide temporary protection to the threatened roadway until a more permanent solution is designed and approved.
6. The area is partially armored with a number of private shoreline structures to the north of the project area.
7. The applicant is developing a long-term plan for erosion control that may include a permanent rock revetment to protect the roadway.
8. The Applicant (County of Kauai) is in the process of obtaining a certified shoreline from the DLNR and has submitted an application for processing. It is the understanding of the DLNR that the applicant will fulfill the requirements of the DLNR to obtain a certified shoreline as part of this emergency request.

1. The sand proposed for the bags meets the minimum state standards. The sand meets the following State quality standards:

    a) The proposed fill sand shall not contain more than six (6) percent fines, defined as the #200 sieve (0.074 mm).
    b) The proposed beach fill sand shall not contain more than ten (10) percent coarse sediment, defined as the #4 sieve (4.76 mm) and shall be screened to remove any non-beach compatible material and rubble.
    c) No more than 50 (fifty) percent of the fill sand shall have a grain diameter less than 0.125 mm as measured by #120 Standard Sieve Mesh.
    d) Beach fill shall be dominantly composed of naturally occurring carbonate beach or dune sand. Crushed limestone or other man made or non carbonate sands are unacceptable.

EXHIBIT 8

DEPARTMENT ACTION
Terms and Conditions

The Chairperson of the Department of Land and Natural Resources hereby authorizes your emergency request for a temporary Coconut fiber (Coir) sandbag revetment fronting the subject portion of Aliomanu Road. This authorization includes, but is not limited to the following terms and conditions:

2. The project includes the installation of approximately 488, (54" x 37") Coir sandbags and requires (160yd^3 of sand).

3. The applicant (County of Kauai) is in the process of obtaining a certified shoreline from the DLNR. This emergency authorization is not contingent on a certified shoreline but it is the understanding of the DLNR that the certified shoreline will be obtained by the applicant. If the applicant fails to obtain a certified shoreline within one (1) year from the date of final authorization, the DLNR shall review the emergency authorization for consistency with the terms and conditions of this authorization.

4. Basalt rocks removed along the project area for the structure installation shall be left within the immediate shoreline area in accordance with construction note #5.

5. The applicant shall ensure that excessive siltation and turbidity is contained or otherwise minimized to the satisfaction of the DLNR, DOH or other agency, through silt containment devices or barriers, high sand quality and selective sand placement.

6. The applicant shall obtain a right-of-entry permit or other land disposition approval from the State of Hawaii, Land Division prior to the inception of project work (808) 984-8103.

7. Any work or construction authorized by this letter shall be initiated within six (6) months of the approval of such use, and, unless otherwise authorized, shall be completed within twelve (12) months of the approval of such use. The applicant shall notify the Department before construction activity is initiated and when it is completed.

8. Any alterations, repairs or additional activities shall be submitted to the DLNR for review under this authorization and may be subject to additional regulatory requirements and conditions.

9. This action is temporary to alleviate the emergency until long-term measures can be implemented. The DLNR reserves the right to terminate this authorization if it is determined the structure is having an adverse impact on the environment or if other shore protection alternatives are available.

10. Sand utilized for the project will be from an approved sand source. No sand shall be extracted from the beach fronting the project for any purpose.

11. Transfer of ownership of the subject property includes the responsibility of the new owner to adhere to the terms and conditions of this authorization.

EXHIBIT 8

12. At the conclusion of work, the area shall be clean of all construction material, and the site shall be restored to a condition acceptable to the Chairperson.

13. The activity shall not adversely affect a federally listed threatened or endangered species or a species proposed for such designation, or destroy or adversely modify its designated critical habitat.

14. The activity shall not substantially disrupt the movement of those species of aquatic life indigenous to the area, including those species, which normally migrate through the area.

15. When the Chairperson is notified by the applicant or the public that an individual activity deviates from the scope of an application approved by this letter, or activities are adversely affecting fish or wildlife resources or their harvest, the Chairperson will direct the applicant to undertake corrective measures to address the condition affecting these resources. The applicant must suspend or modify the activity to the extent necessary to mitigate or eliminate the adverse effect.

16. When the Chairperson is notified by the U.S. Fish and Wildlife Service, the National Marine Fisheries Service or the State DLNR that an individual activity or activities authorized by this letter is adversely affecting fish or wildlife resources or their harvest, the Chairperson will direct the applicant to undertake corrective measures to address the condition affecting these resources. The applicant must suspend or modify the activity to the extent necessary to mitigate or eliminate the adverse effect.

17. To avoid encroachments upon the area, the applicant shall not use artificially accreted areas due to nourishment or hardening as indicators of the shoreline.

18. Where any interference, nuisance, or harm may be caused, or hazard established by the activities authorized under this authorization, the applicant shall be required to take reasonable measures to minimize or eliminate the interference, nuisance, harm or hazard.

19. No contamination of the marine or coastal environment (trash or debris) shall result from project-related activities authorized under this authorization.

20. No motorized construction equipment is to be operated in the water at any time.

21. In the event there is any petroleum spill on the sand, the operator shall promptly remove the contaminated sand from the beach and immediately contact the DLNR/OCCL staff at (808) 587-0377, to conduct a visual inspection and to provide appropriate guidance.

22. For projects authorized by this letter, the applicant, its successors and assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim, or demand for property damage, personal injury, and death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors, and agents under projects authorized under this letter.

23. The DLNR reserves the right to impose additional terms and conditions on projects authorized under this letter, including revocation if it deems it necessary.

EXHIBIT 8

24. The applicant shall obtain and comply with all necessary federal, state and county permits for the proposed activities in accordance with all applicable statutes, ordinances, rules, and regulations of the federal, state, and county governments for projects authorized under this letter

25. In the event that historic sites, including human burials are uncovered during construction activities, all work in the vicinity must stop immediately and contact the State Historic Preservation Division at (808) 692-8015.

26. Failure on the part of the applicant to comply with any conditions imposed under this authorization shall render the authorization null and void.

27. The applicant shall take measures to ensure that the public is adequately informed of the project work once it is initiated and the need to avoid the project area during the operation and shall notify all abutting property owners and community organizations that may be affected by the proposed action.

28. The applicant shall implement standard Best Management Practices (BMPs), including the ability to contain and minimize silt in nearshore waters and clean up fuel; fluid or oil spills immediately for projects authorized by this letter. Equipment must not be refueled in the shoreline area. If visible petroleum, persistent turbidity or other unusual substances are observed in the water as a result of the proposed operation, all work must cease immediately to ascertain the source of the substance. The DLNR/OCCL staff shall be contacted immediately at (808) 587-0377, to conduct a visual inspection.

Additional Monitoring:

29. The applicant must submit a written completion report to the OCCL within three months of completion of the project. The completion report must include, as appropriate, descriptions of the construction activities, discussion(s) of any deviations from the proposed project design and the cause of these deviations, results of any environmental monitoring, discussion(s) of any necessary corrective action(s), and photographs documenting the progress of the permitted work before, during and after construction.

30. As a temporary emergency project, the applicant shall provide an initial completion report and follow-up summary reports ***annually*** to the Department describing the condition of the sandbags and any impacts to the local nearshore processes for three (3) years from the date of acceptance or until a permitted permanent structure is completed.

Authorization Expiration

It is understood that the coconut materials are a temporary response to prevent the immediate loss of the roadway and as such are not a permanent structure. After completion, the proposed sandbag project shall be reviewed for consistency and accuracy to the plans by DLNR staff.

This authorization is valid for three (3) years from the date of acceptance, at which time, the authorization shall expire. Upon expiration, the applicant shall remove all the authorized

EXHIBIT 8

material (except approved sand) to the satisfaction of the DLNR or apply for an extension to the authorization.

Please acknowledge receipt of this authorization, with the above noted conditions, in the space provided below. Please sign two copies. Retain one and return the other within fifteen (15) days. Please notify the OCCL in advance of the anticipated construction dates and notify the OCCL immediately if any changes to the scope or schedule are anticipated. Should you have any questions, please contact the Office of Conservation and Coastal Lands (OCCL) at (808) 587-0377.

Sincerely,

for **Laura H. Thielen**, Chairperson
Department of Land and Natural Resources

Attachments (Figures 1-3)

cc: Chairperson
Kauai Board Member
DAR/HPD
Kauai County Planning Dept- Ian Costa
Kauai County Dept of Public Works- Donald Fujimoto
OHA/DOH, Clean Water
USFWS/NMFS/USACE

I concur with the conditions of this letter:

Applicant's Signature Applicant's Name and Title Date

Note: transfer of ownership (Title) conveys all terms and conditions of this authorization to the new owner.

EXHIBIT 8

Figure 1. Location Condition (9/20/2007)

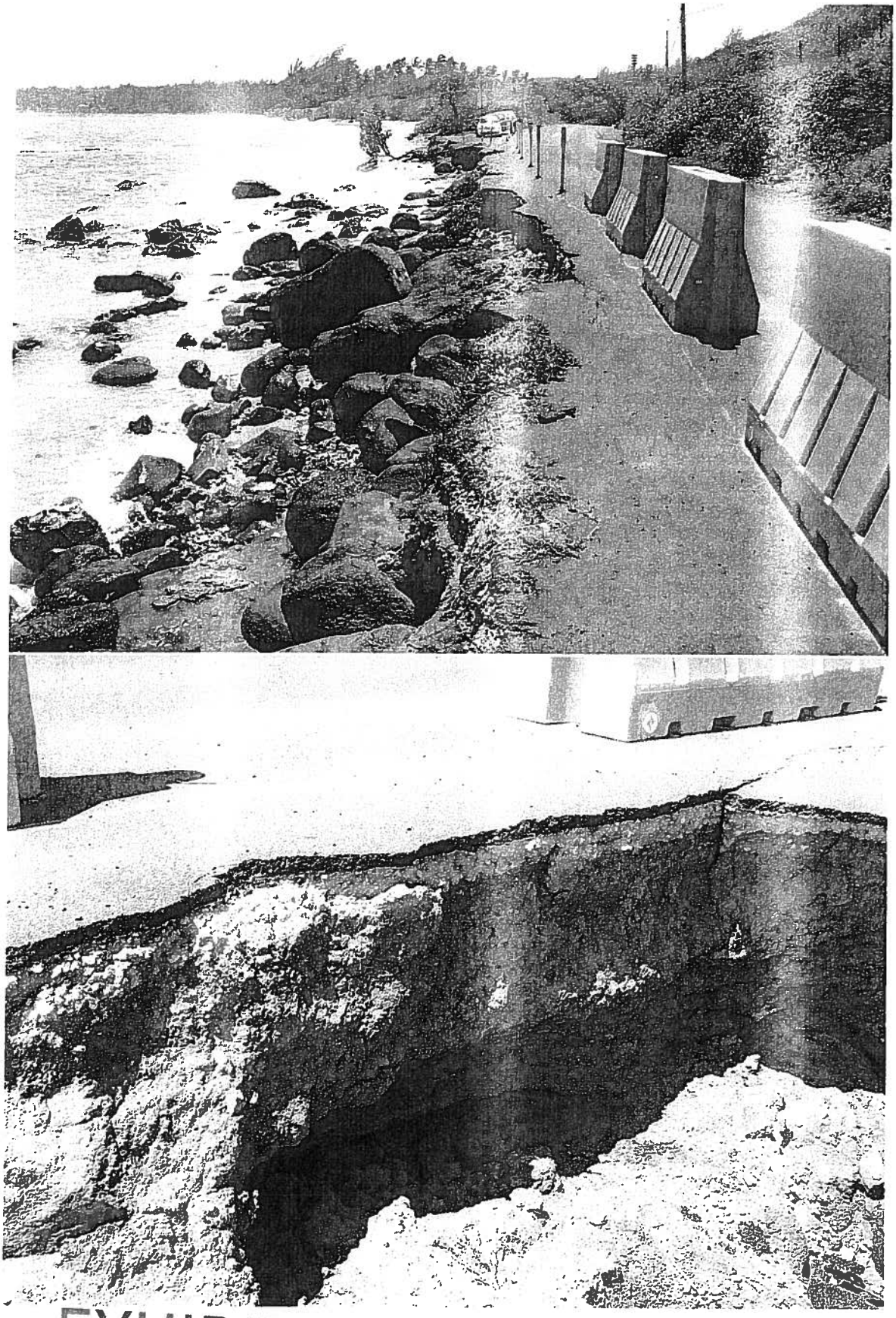


EXHIBIT 8

Figure 2. Proposed Plan (C-2)

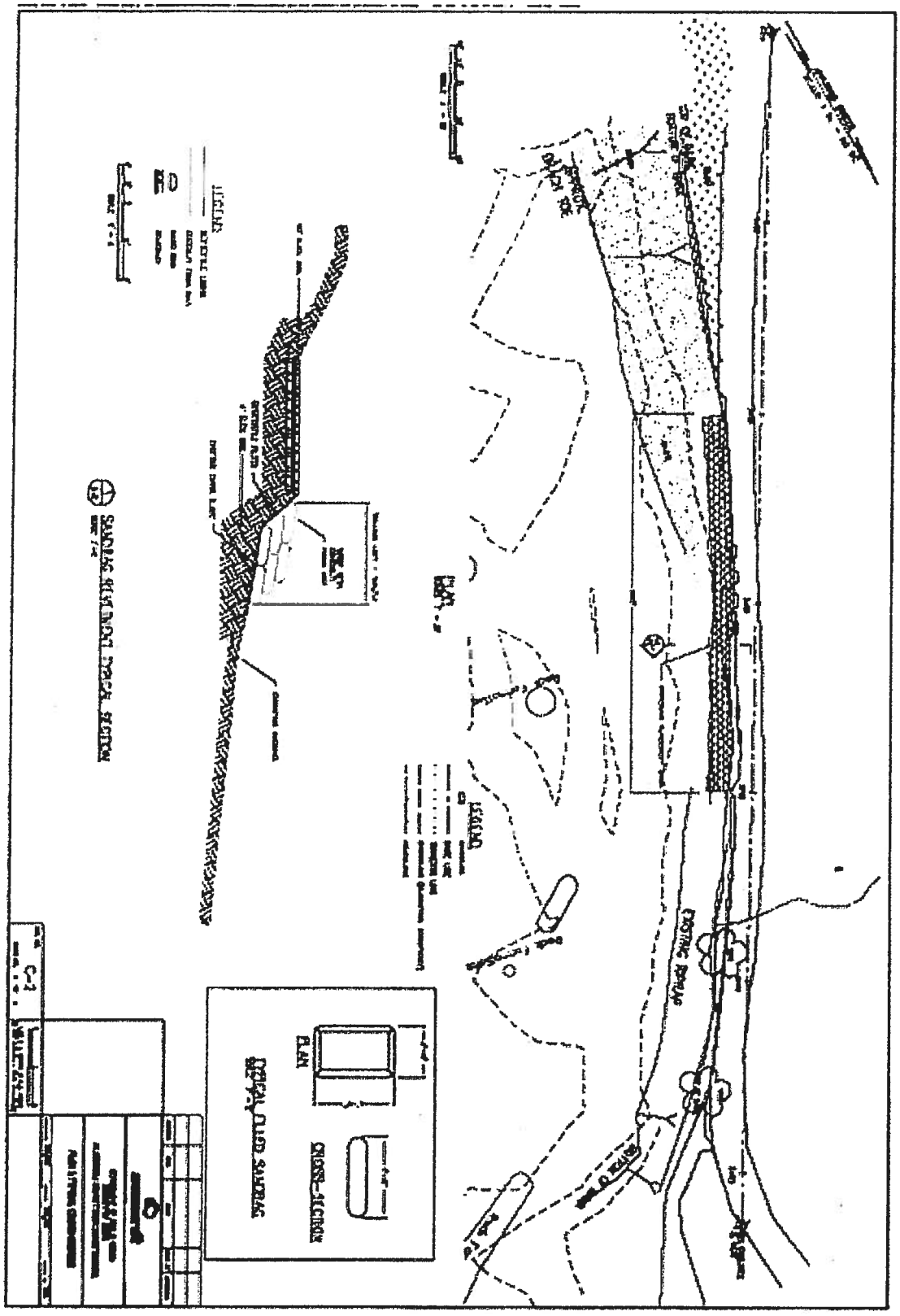


EXHIBIT 8

Figure 3. Construction Notes (T-2)

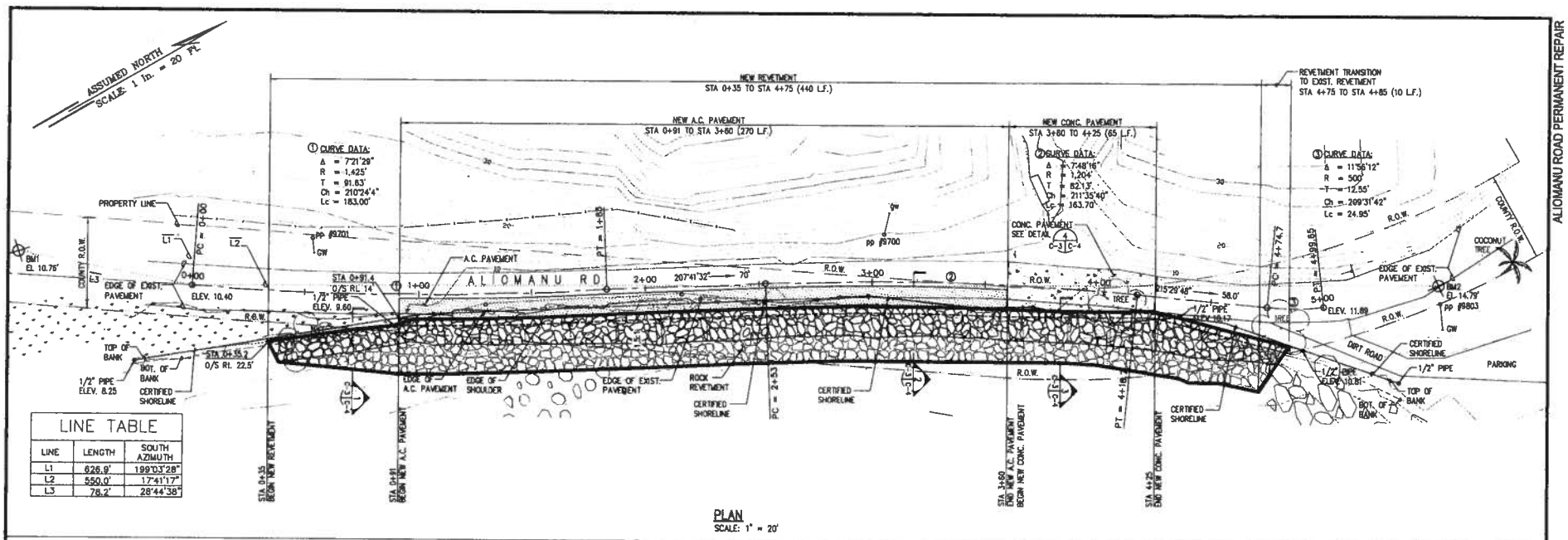
SANDBAG CONSTRUCTION NOTES

1. ALL WORK TO BE DONE IN ACCORDANCE WITH THE COUNTY OF HAWAII, "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION" DATED SET. 1984 AND "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" DATED SEPT. 1986.
2. SANDBAGS SHALL BE COIR (COCNUT FIBER) BAGS. EACH BAG SHALL BE 54" x 37" WHEN EMPTY. FILL EACH BAG WITH 700–800 POUNDS OF APPROVED SAND. THE BAGS MAY BE FILLED AT THE SAND SOURCE IF APPROVED BY THE ENGINEER AND LAND OWNER.
3. THE SANDBAGS SHALL BE WRAPPED IN COIR MATTING FOR REINFORCEMENT. A GEOTEXTILE FILTER SHALL BE PLACED BEHIND AND BELOW THE BAGS TO PREVENT SOIL FROM PIPING THROUGH FROM THE ERODED EMBANKMENT.
4. SANOBAGS SHALL BE PLACED TO FIT THE EXISTING BANK CONTOURS AT THE TIME OF CONSTRUCTION. BAGS SHALL NOT BE STACKED AT A SLOPE STEEPER THAN 1V TO 1.5H. THE VOLUME OF THE BAG REVETMENT SHALL NOT EXCEED 1 CUBIC YARD PER LINEAR FOOT. THE STRUCTURE SHALL NOT EXCEED A LENGTH OF 200 FEET.
5. EXCAVATE A FOOTING FOR THE BOTTOM LAYER OF BAGS AS SHOWN ON THE PLANS. EXCAVATED MATERIAL SHALL BE REMOVED TO A LOCATION APPROVED BY THE ENGINEER. IT SHALL NOT BE PLACED ON THE BEACH OR IN THE WATER. REMOVE ROCKS FROM THE SANDBAG PLACEMENT AREA AND PLACE THEM SEAWARD OF THE REVETMENT TOE. DO NOT REMOVE ROCKS THAT ARE EMBEDED IN THE ERODING EMBANKMENT.
6. THE CONTRACTOR SHALL MAINTAIN ONE TRAFFIC LANE FOR LOCAL TRAFFIC. ALIOMANU ROAD SHALL NOT BE CLOSED WITHOUT PERMISSION FROM THE ENGINEER. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", AND TO THE SATISFACTION OF THE ENGINEER.
7. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, AND SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF SAME IN THE EVENT OF DAMAGES DUE TO HIS CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY COMPANIES. PERSONAL INJURY RESULTING FROM CONTACT WITH EXISTING UTILITIES SHALL BE THE CONTRACTORS RESPONSIBILITY.
8. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE COUNTY'S INSPECTOR FOR DIRECTION.

PUBLIC HEALTH SAFETY AND CONVENIENCE NOTES

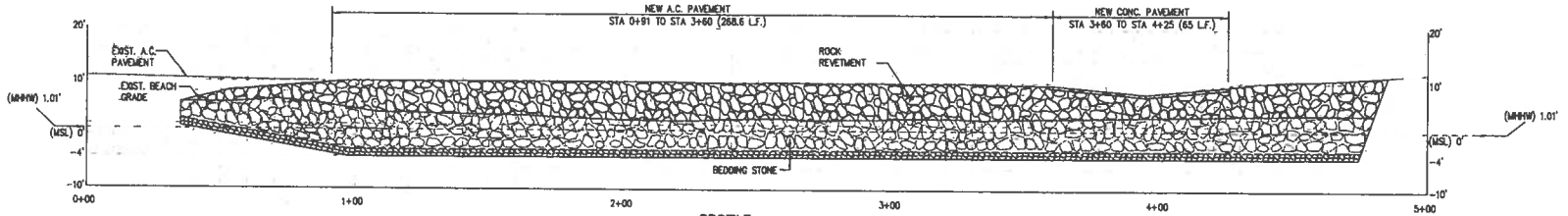
1. CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.
2. THE CONTRACTOR AT HIS/HER EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM RUBBISH, DUST, NOISE, EROSION, ETC. THE WORK SHALL BE DONE IN CONFORMANCE WITH THE AIR AND WATER POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.
3. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SILT OR DEBRIS IN ANY FORM TO FALL SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATION OCCUR, THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS AS NECESSARY.
4. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.
5. THE CONTRACTOR'S ATTENTION IS DIRECTED TO CHAPTER 46, PUBLIC HEALTH REGULATIONS, DEPARTMENT OF HEALTH, STATE OF HAWAII, "COMMUNITY NOISE CONTROL," IN WHICH MAXIMUM PERMISSIBLE NOISE LEVELS HAVE BEEN SET. IF THE CONSTRUCTION WORK REQUIRES A PERMIT FROM THE DIRECTOR OF HEALTH, THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 46 AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS AND THE PROCEDURES FOR OBTAINING A PERMIT FOR THE CONSTRUCTION ACTIVITIES. APPLICATION AND INFORMATION ON VARIANCES ARE AVAILABLE FROM THE ENVIRONMENTAL PROTECTION AND HEALTH SERVICES DIVISION, 1250 PUNCHBOWL ST., HONOLULU, HI 96813 OR BY TELEPHONE (548–6455).
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF CHAPTER 54, WATER QUALITY STANDARDS, AND CHAPTER 55, WATER POLLUTION CONTROL, OF TITLE 11, ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH. THE CONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF THE BEST MANAGEMENT PRACTICES PLAN (BMP) FOR THE PROJECT.
7. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION ACTIVITY SO AS TO CAUSE FALLING ROCK, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATER COURSES. SHOULD SUCH VIOLATIONS OCCUR, THE COSTS INCURRED FOR ANY REMEDIAL ACTION SHALL BE PAYABLE BY THE CONTRACTOR.

EXHIBIT 8



LINE TABLE		
LINE	LENGTH	SOUTH AZIMUTH
L1	626.9'	199°03'28"
L2	550.0'	17°41'17"
L3	78.2'	28°44'38"

PLAN
SCALE: 1" = 20'



PROFILE
V SCALE: 1" = 10'
H SCALE: 1" = 20'

LEGEND

- NEW REVETMENT
- NEW CONC. PAVEMENT
- NEW A.C. PAVEMENT
- BASE LINE
- PROPERTY LINE
- TRAVERSE LINE
- GRADE BREAK
- CERTIFIED SHORELINE
- TOP OF BANK
- BOTTOM OF BANK
- CONTOUR
- FENCELINE

NOTES:

1. FINISH SURFACE OF NEW A.C. PAVEMENT AND CONC. PAVEMENT SHALL MATCH THE ORIGINAL SURFACE GRADE.
2. ELEVATIONS REFERENCED TO MEAN SEA LEVEL (MSL).

20' 10' 0 20' 40'
GRAPHIC SCALE

PLAN & PROFILE
SCALE: AS NOTED

REVISION	DATE	BRIEF	MADE BY	APPROVED

WARREN E. BUCKER
LICENSED PROFESSIONAL ENGINEER
No. 10606-C
HAWAII, U.S.A.

oceanit

DEPARTMENT OF PUBLIC WORKS
COUNTY OF KAUAI
ALIOMANU ROAD REPAIR

PLAN & PROFILE

DESIGNED BY: CCG/WEB DRAWN BY: CCG/MY CHECKED BY: WEB

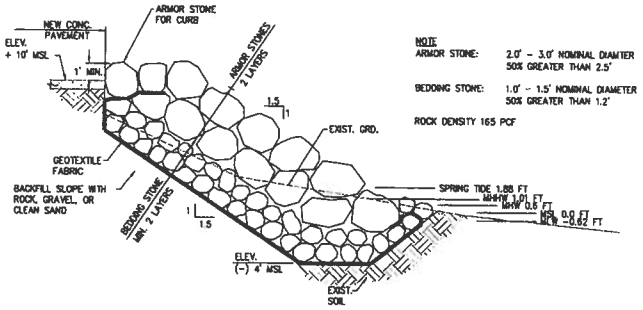
DWG. NO. C-3
SHEET NO. 5 OF 7

LINE IS 2 INCHES AT FULL SCALE
(IF NOT 2-inches : Scale Accordingly)

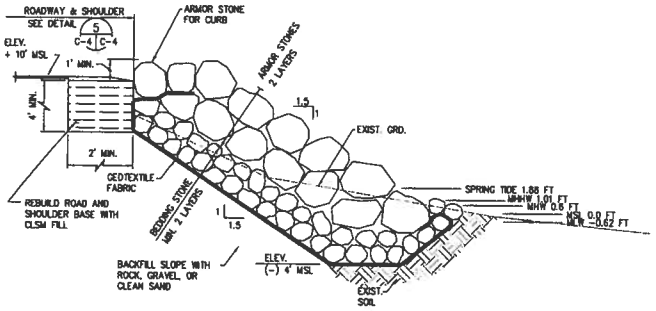
ALIOMANU ROAD PERMANENT REPAIR

EXHIBIT 9

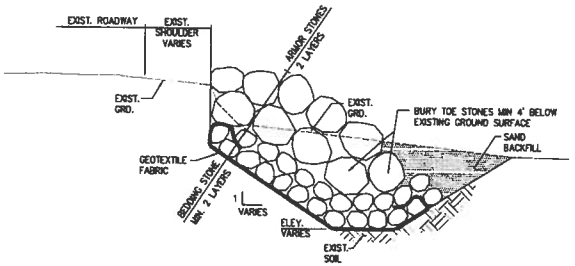
MAY 2010



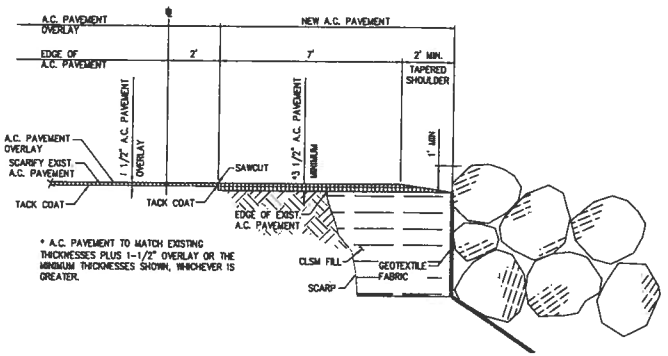
3 C-3 | C-4 **ROCK REVETMENT TYPICAL SECTION STA 3+60 TO STA 4+75**
SCALE: 1"=4'



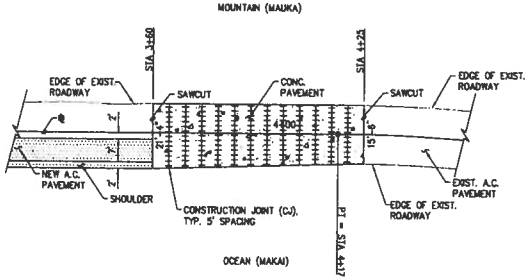
2 C-3 | C-4 **ROCK REVETMENT SECTION STA 0+35 TO STA 0+91**
SCALE: 1"=4'



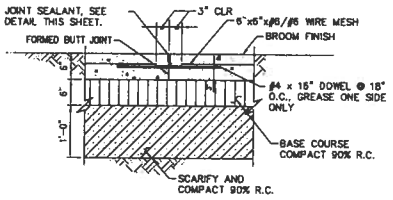
1 C-3 | C-4 **ROCK REVETMENT SECTION STA 0+35 TO STA 0+91**
SCALE: 1"=4'



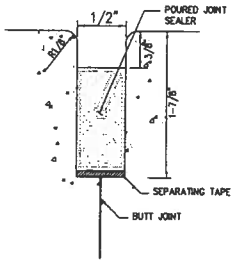
5 C-4 | C-4 **TYPICAL ROADWAY AND SHOULDER DETAIL**
SCALE: 1"=2'



PLAN



SECTION



JOINT SEALANT

NOTE:

FINISH SURFACE OF CONCRETE PAVEMENT SHALL BE THE ORIGINAL SURFACE GRADE ±.

SAWCUT SHALL BE MADE SAME DAY AS POUR.

SCALES

2' 1' 0 2' 4'

SCALE: 1" = 2'

4 C-3 | C-4 **CONCRETE PAVEMENT DETAIL**
NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

oceanit

DEPARTMENT OF PUBLIC WORKS
COUNTY OF KAUAI
ALIOMANU ROAD REPAIR

TYPICAL DETAILS

DESIGNED BY: WEB | DRAWN BY: MMT | CHECKED BY: WEB

DRG. NO. C-4
SHEET NO. 6 OF 7

LINE IS 2 INCHES AT FULL SCALE (IF NOT 2-Inches - Scale Accordingly)

MAY 2010

ALIOMANU ROAD PERMANENT REPAIR

EXHIBIT 9